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# **Conflict Driven Diving for Mixed Integer Programming**

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URL: <http://www.zib.de>

ZIB-Report (Print) ISSN 1438-0064  
ZIB-Report (Internet) ISSN 2192-7782

# Conflict Driven Diving for Mixed Integer Programming

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## Abstract

The analysis of infeasibility plays an essential role in solving satisfiability problems (SAT) and mixed integer programs (MIPs). In mixed integer programming, this procedure is called conflict analysis. So far, modern MIP solvers use conflict analysis only for domain propagation and improving the dual bound, i.e., fathoming nodes that cannot contain feasible solutions. In this short paper, we present a new approach which uses conflict information to improve the primal bound during a MIP solve. To derive new improving primal solutions, we use a conflict driven diving heuristic called *conflict diving* that uses the information obtained by conflict analysis. Conflict diving pursues a twofold strategy. By using conflict information, the new diving approach is guided into parts of the search space that are usually not explored by other diving heuristics. At the same time, conflict diving has a fail-fast-strategy to reduce the time spent if it cannot find a new primal solution. As a byproduct, additional valid conflict constraints can be derived, from which a MIP solver can benefit as well. To show the added-value of conflict diving within a MIP solver, conflict diving has been implemented within the non-commercial MIP solver SCIP. Experiments are carried out on general MIP instances from standard public available test sets, like MIPLIB2010 or COR@L. Our experiments indicate that conflict diving can reduce the solving time on hard instances by 17%.

## 1 Introduction

In this paper *mixed integer programs (MIPs)* of the form

$$c^* = \min\{c^T x \mid Ax \geq b, \ell \leq x \leq u, x_i \in \mathbb{Z} \forall i \in \mathcal{I}\}, \quad (1)$$

with objective coefficient vector  $c \in \mathbb{R}^n$ , constraint coefficient matrix  $A \in \mathbb{R}^{m \times n}$ , constraint right-hand side  $b \in \mathbb{R}^m$ , and variable bounds  $\ell, u \in \overline{\mathbb{R}}^n$ , where  $\overline{\mathbb{R}} := \mathbb{R} \cup \{\pm\infty\}$ , are considered. Furthermore, let  $\mathcal{I} \subseteq \mathcal{N} = \{1, \dots, n\}$  be the index set of variables that are restricted to integer values.

The most commonly used method to solve MIPs is the LP-based branch-and-bound algorithm [11, 18]. In modern MIP solvers this procedure is accelerated by various extensions. Branch-and-bound is a divide-and-conquer method which splits the search space sequentially into smaller subproblems that are (hopefully) easier to solve. During these branching steps a lower bound on each local subproblem is computed. Therefore, the integrality requirements are omitted and the obtained *linear programming (LP)* relaxation

$$c_{LP}^* = \min\{c^t x \mid Ax \geq b, \ell \leq x \leq u, x \in \mathbb{R}^n\} \quad (2)$$

of (1) is solved.

On the other hand, an upper bound on the global problem is given by the objective value of the incumbent solution, i.e., the best solution found so far, if available. During this procedure subproblems are regularly fathomed, either due to bounding or infeasibility. In the first case, subproblems whose lower bound exceeds the global upper bound are disregarded because they cannot contain an improving solution. In the second case, the infeasibility of a subproblem is either proven by contradicting variable bound changes or by an infeasible LP relaxation. However, both cases are equivalent and any subproblem that got fathomed due to exceeding the global upper bound can be treated as infeasible, i.e., by adding a inequality constraint parallel to the objective function and right-hand side slightly smaller than the incumbent solution value.

It is evident that the branch-and-bound algorithm benefits directly from finding good solutions as early as possible. These solutions either originate directly from the LP relaxation, i.e., all variables fulfill the integrality conditions in the LP solution, or get constructed by so-called primal heuristics. A primal heuristic is an incomplete method without any success guarantee.

If a node gets fathomed due to infeasibility modern MIP solvers try to 'learn' from those subproblems. A subproblem can be infeasible due to contradicting implications, e.g., derived by domain propagation, or by an infeasible LP relaxation. This learning is called conflict analysis. Conflict analysis has its origin in solving satisfiability problems (SAT) and goes back to [21]. Similar ideas are used in constraint programming (see, e.g., [14, 15, 24]) and mixed-integer programming (see, e.g., [12]). The main idea of conflict analysis is to derive additional and more information about the infeasibility.

One method to derive these information is to construct the so-called conflict graph which represents the logic of how the set of branching decisions led to the detection of infeasibility. The conflict graph is directed and acyclic. All vertices represent bound changes of variables and the arcs correspond to bound changes implied by propagation. In addition to these inner vertices which represent the bound changes from domain propagation, the graph features source vertices for the bound changes that correspond to branching decisions and an artificial sink vertex representing the infeasibility. Then, each cut that separates the branching decisions from the artificial infeasibility vertex gives rise to a valid *conflict constraint*.

The information obtained by conflict analysis can be used for variable selection in branching or to tentatively generate conflicts before branching [2, 16].

Moreover, it is used to analyze infeasibility detected in primal heuristics [8, 9]. On the other hand, there are approaches that do not start with an infeasible subproblem. These approaches try to generate valid conflict constraints either by a sophisticated random sampling approach [13] or a combination of CP and MIP search [7]. In the latter case, the CP search is used to explore a few thousand nodes in a fraction of time a MIP solver would need. All information derived during the CP search, e.g., valid conflict constraints or global bound deductions, are valid for the MIP search. Moreover, the so-called *variable state independent decaying sum* [22] can be used to initialize a hybrid branching rule [2].

The contribution of this short paper is—to the best of our knowledge—the first diving heuristic that uses conflict information solely for improving the primal bound within a MIP solver. Therefore, the well-known concept of variable locks [1] is transferred to conflict constraints. At the same time, additional valid conflict constraints can be derived which have impact on improving the dual bound. *Conflict diving* is motivated by general diving heuristics like coefficient diving [5] and conflict sampling approaches like rapid learning [7]. Thus, conflict diving contributes to the bounding step of the LP-based branch-and-bound-algorithm by generating new primal solutions and to the fathoming of infeasible subproblems by generating conflict constraints. In Section 2 the concept of variable locks is transferred to conflict constraints, which are the basis of our new conflict driven diving approach. Moreover, we discuss the conflict driven diving procedure in detail. Finally, we present computational experiments in Section 3. For our experiments the academic MIP solver SCIP [20] was used.

## 2 Conflict Diving

The main idea of *conflict diving* is to exploit conflict information to derive new improving solutions. Therefore, the concept of variable locks, which is usually used for model constraints only, is transferred to conflict constraints.

**Definition 1 (Variable Locks [1])** *For a mixed integer program of form (1), the variable lock numbers are given by the number of positive and negative coefficients per column:  $\zeta_j^- = |\{i \mid A_{ij} > 0\}|$  and  $\zeta_j^+ = |\{i \mid A_{ij} < 0\}|$ .*

If a variable has no down-locks (or up-locks), the variable can always set to its lower (or upper) bound without violating a constraint. On the other hand, if a variable has down-locks (or up-locks) rounding the variable downwards (or upwards) might violate at least one constraint. If a constraint down-locks  $x_i$  and is tight w.r.t. the current LP solution, rounding  $x_i$  downwards will violate the constraint. Hence, the number of variable locks measures the “risk” that rounding a variable downwards or upwards lead to constraint violations.

In the following, the number of conflict constraints up-locking and down-locking a variable  $x_i$  will be denoted by  $\xi_i^+$  and  $\xi_i^-$ , respectively. Analogous to variable locks, rounding a variable  $x_i$  with  $\xi_i^- = 0$  downwards will not lead to a

violation of conflict constraints. If a conflict constraint is a conical combination of model constraints [23, 26] and contributes to the number of conflict down-locks of  $x_i$ , then there exist at least one model constraint that contributes the variable down-locks of  $x_i$ . Therefore, conflict locks can measure the “risk” of both violating model and conflict constraints.

Note, the concept of conflict locks can be easily extended to other types of constraints that are not part of the original model, e.g., cutting planes.

At first glance, the difference between conflict locks and VSIDS (variable state independent decaying sum) [22] seems to be quite small. The main differences between both decision scores are (a) for a fixed set of conflict constraints and variables the number of conflict locks does not change over time, whereas the VSIDS score of a variable gets periodically scaled by a predefined constant; (b) conflict locks only take the current set of conflict constraints into account, whereas VSIDS also incorporate past conflict constraints.

Conflict diving (cf. Algorithm 1) performs a depth-first search and resolves the LP relaxation depending on the number of domain changes found during domain propagation performed at the current local subproblem. Whenever the current subproblem is proven to be infeasible a backtrack of length one is performed. The procedure stops if no branching candidate is left or a feasible solution is found.

At every depth level conflict diving aims to exploit parts of the search space that are usually not considered by other diving heuristics. At the same time, it follows a fail-fast-strategy. The rounding direction of a variable  $x_i$  is given by

$$\phi(i) = \begin{cases} \text{upwards,} & \text{if } \begin{cases} \xi_i^+ > \xi_i^- > 0, \xi_i^- > 0 \wedge \xi_i^+ = 0, \\ \xi_i^+ = \xi_i^- \wedge \zeta_i^+ > \zeta_i^-, \text{ or } , \\ \xi_i^+ = \xi_i^- \wedge \zeta_i^+ = \zeta_i^- \wedge f_i > \frac{1}{2}. \end{cases} \\ \text{downwards,} & \text{if } \begin{cases} \xi_i^- > \xi_i^+ > 0, \xi_i^+ > 0 \wedge \xi_i^- = 0, \\ \xi_i^+ = \xi_i^- \wedge \zeta_i^- > \zeta_i^+, \text{ or} \\ \xi_i^+ = \xi_i^- \wedge \zeta_i^- = \zeta_i^+ \wedge f_i < \frac{1}{2}. \end{cases} \\ \text{random(upwards, downwards),} & \text{otherwise.} \end{cases}$$

In words, if a variable has conflict locks in exactly one direction, i.e., either conflict up-locks or conflict down-locks, it will be rounded into the direction with no conflict locks, e.g., round  $x_i$  downwards if  $\xi_i^+ > \xi_i^- = 0$ . If a variable has no conflict down-locks (or conflict up-locks) rounding down (or up) will always be feasible w.r.t. conflict constraints. On the other hand, if a variable has conflict locks in both directions, rounding upwards and downwards is risky in the sense that it might lead to a violation of at least one conflict constraints. In that case, variable  $x_i$  will be rounded upwards (or downwards) if  $\xi_i^+ > \xi_i^- > 0$  (or  $\xi_i^- > \xi_i^+ > 0$ ). With this approach, we pursue a fail-fast-strategy. A reason for this is that conflicts derived from higher parts of the search tree (or diving path) are usually smaller and faster to propagate because of less bound deductions

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**Algorithm 1: CONFLICTDIVING**

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**Input** : LP solution  $x^{LP}$   
**Output**: Solution candidate  $x^{CD}$  or NULL

- 1  $x^{CD} \leftarrow \text{NULL}, \tilde{x} \leftarrow x^{LP}$
- 2  $\mathcal{B} \leftarrow \{i \in \mathcal{I} \mid \tilde{x}_i \notin \mathbb{Z}\}$  // set of branching candidates
- 3 **while**  $x^{CD} == \text{NULL}$  and  $\mathcal{B} \neq \emptyset$  **do**
- 4   **forall the**  $i \in \mathcal{B}$  **do**
  1. Determine rounding direction  $\phi(i) \in \{\text{upwards}, \text{downwards}\}$ .
  2. Determine LP fractionality:  $f_i \leftarrow \tilde{x}_i - \lfloor \tilde{x}_i \rfloor$
  3. Calculate variable score:  $s_i \leftarrow \text{VARIABLESCORE}(x_i, \phi(i), f_i)$  (Alg. 2)
- 5   Select candidate  $x_i$  with maximal score  $s_i$ ;  $\mathcal{B} \leftarrow \mathcal{B} \setminus i$
- 6   **if**  $\phi(i) = \text{upwards}$  **then**
- 7      $l_i \leftarrow \lceil \tilde{x}_i \rceil$  // tighten local lower bound
- 8   **else**
- 9      $u_i \leftarrow \lfloor \tilde{x}_i \rfloor$  // tighten local upper bound
- 10   Propagate this bound change, e.g., call propagation routine of SCIP
- 11   **if** *Infeasibility detected* **then**
- 12     Analyze infeasibility, add conflict constraints, perform 1-level backtrack, goto Line 5 or 19 if  $\mathcal{B} = \emptyset$
- 13   (optional) Re-solve local LP relaxation
- 14   **if** *Infeasibility detected* **then**
- 15     Analyze infeasibility, add conflict constraints, perform 1-level backtrack, goto Line 5 or 19 if  $\mathcal{B} = \emptyset$
- 16   Update  $\tilde{x}$  and  $\mathcal{B}$  if LP was resolved
- 17   **if**  $\tilde{x}_i \in \mathbb{Z} \forall i \in \mathcal{I}$  **then**
- 18      $x^{CD} \leftarrow \tilde{x}$
- 19 **return**  $x^{CD}$

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**Algorithm 2: VARIABLESCORE**

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**Input** : Variable  $x_i$ , rounding direction  $\phi(i)$ , fractional part of LP solution  $f_i$   
**Output**: Score  $s_i$

- 1  $s_i \leftarrow 0$
- 2 **if**  $\phi(i) = \text{upwards}$  **then**
- 3   **if**  $\xi_i^+ > 0$  **then**
- 4      $s_i \leftarrow \xi_i^+$
- 5   **if**  $\zeta_i^+ > 0$  **then**
- 6      $s_i \leftarrow s_i + \varepsilon \cdot \frac{\zeta_i^+}{\zeta_i^+ + \zeta_i^-}$  // add portion of up-locks
- 7 **else**
- 8   **if**  $\xi_i^- > 0$  **then**
- 9      $s_i \leftarrow \xi_i^-$
- 10   **if**  $\zeta_i^- > 0$  **then**
- 11      $s_i \leftarrow s_i + \varepsilon \cdot \frac{\zeta_i^-}{\zeta_i^+ + \zeta_i^-}$  // add portion of down-locks
- 12 **if**  $f_i < 0.01$  or  $f_i > 0.99$  **then**
- 13    $s_i \leftarrow 0.1 \cdot s_i$  // penalize too integral LP solutions
- 14 **if**  $x_i$  is not binary **then**
- 15    $s_i \leftarrow 0.1 \cdot s_i$  // prefer binary variables
- 16 **return**  $s_i$

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are involved. Finally, if a variable  $x_i$  has the same amount of conflict locks in both directions, ties are broken by using variable locks, e.g.,  $x_i$  will be rounded upwards if  $\zeta_i^+ > \zeta_i^-$ . Again, the variable will be rounded into the direction with the higher “risk” to violate constraints. In case of a tie, e.g.,  $\zeta_i^+ = \zeta_i^-$ , the rounding direction depends on the fractionality  $f_i$  of the last LP solution and gets decided randomly if  $f_i = \frac{1}{2}$ .

After the rounding direction of a variable  $x_i$  is determined a score  $s_i$  is calculated (cf. Algorithm 2). Among all potential variables to branch on the variable with the highest score will be selected to be processed next. The score  $s_i$  of each variable  $x_i$  that should be rounded upwards (or downwards) is defined by the number of conflict up-locks (or conflict down-locks). The fraction of variable up-locks (or down-locks) is added for tie breaking. By adding the fraction instead of the absolute number of variable locks we try to avoid overweighting variables that have both many up-locks and many down-locks. The scoring function penalizes variables whose LP solution value is not fractional enough as well as non-binary variables.

In our computational experiments we execute conflict diving whenever (i) at least one valid conflict constraint was already found and (ii) the current depth level is a multiple of 10 (except for the root node depth).

The first assumption is quite natural because without conflict constraints no conflict locks are present. The main difference in the configuration to other diving heuristics in SCIP is the frequency of resolving the LP relaxation. Conflict diving resolves the LP whenever for at least 45% of all undecided variables domain propagation tightened at least one bound. All remaining diving heuristics of SCIP use a threshold of 15%. Since conflict diving uses the fractionality of the LP solution only for tie-breaking, the actual LP solution is not as essential as for other diving heuristics. Another reason for choosing a much higher threshold is the observation that conflicts derived from propagation often propagate better because they already involve integrality information.

### 3 Computational Results

In our computational experiments, we compare the new conflict driven diving approach for generating additional conflict constraints to SCIP in its default configuration. We will refer to the default configuration of SCIP as `default` and SCIP extended by conflict diving as `confdiving`. All experiments were performed with the non-commercial MIP solver SCIP [20] (git hash 9fe7e67, based on SCIP 4.0.1.3), using Soplex 3.0.1.2 (git hash 6d099e6) as LP solver. The experiments were run on a cluster of identical machines, each with an Intel Xeon E5-2690 with 2.6 GHz and 128 GB of RAM; a time limit of 7200 seconds was set. Since a random tie breaking is used whenever neither conflict locks nor variable locks lead to a decision, all experiments were performed with six different global random seeds. Changing the global random seed of SCIP impacts all other parts using random numbers, too. Therefore, the final results with more than the default random seed give a much better base for estimating



**Table 1:** Performance evaluation of `confdiving` compared to SCIP with `default` settings on `MMMC+`. Columns show: number of instances of a particular group (`#`), instances solved by all 6 different random seeds (`solved`), generated nodes (`N`), solving time (`T`), time to best solution (`TtB`), and primal integral (`PI`). Ratio of nodes, time for solving and to best solution, and primal integral compared to `default` is shown in columns `NQ`, `TQ`, `TtBQ`, and `PIQ`.

	<code>#</code>	<code>solved</code>	<code>N</code>	<code>N<sub>Q</sub></code>	<code>T</code>	<code>T<sub>Q</sub></code>	<code>TtB</code>	<code>TtB<sub>Q</sub></code>	<code>PI</code>	<code>PI<sub>Q</sub></code>
<b>all</b>										
<code>confdiving</code>	663	<b>352</b>	5264.41	0.99	522.36	0.99	255.12	0.97	2970.26	0.99
<code>default</code>	663	345	5293.04	–	528.56	–	263.08	–	3013.03	–
<b>[100,tilim]</b>										
<code>confdiving</code>	154	<b>150</b>	6562.55	<b>0.93</b>	547.40	<b>0.94</b>	294.62	1.00	3661.04	<b>0.95</b>
<code>default</code>	154	143	7062.97	–	583.05	–	293.48	–	3841.17	–
<b>[1000,tilim]</b>										
<code>confdiving</code>	58	<b>54</b>	23537.48	<b>0.82</b>	1697.19	<b>0.83</b>	697.46	1.00	7549.09	0.96
<code>default</code>	58	47	28703.00	–	2039.15	–	698.44	–	7852.20	–
<b>MIPLIB2010</b>										
<code>confdiving</code>	87	<b>72</b>	8082.45	0.98	482.03	0.97	225.31	<b>0.87</b>	2623.76	<b>0.91</b>
<code>default</code>	87	70	8276.15	–	496.35	–	260.32	–	2884.47	–

the impact of conflict diving. However, the experiments are still deterministic because all random numbers used in SCIP are deterministic.

As a test set we used a union of MIPLIB3 [10], MIPLIB2003 [3], MIPLIB2010 [17], and the COR@L [19] test set. Note that all 361 instances of MIPLIB2010 are part of the test set and not only the 87 benchmark instances. Moreover, we removed all duplicates and discarded all MIPLIB2010 instances that are known to be numerically unstable. Finally, the test set consists of 669 publicly available instances, and we will refer to it as `MMMC+`.

Table 1 shows the aggregated computational results on `MMMC+`. An instance is counted as solved by a configuration if it was solved by all six random seeds. For every instance, the number of solved branch-and-bound nodes, solving time, time until best solution, and primal integral [6] are the shifted geometric means [1] of the respective measure taken over all six random seeds. A shift of 100, 1, 1, and 10, respectively, is used. In addition to the usual performance indicators like nodes and solving time, we use the time spent until the best solution was found and the primal integral to measure the impact of the conflict driven heuristic on the primal bound, e.g., solutions found by conflict diving. Moreover, Columns 5, 7, 9, and 11 give ratios w.r.t. `default` which is used as a baseline.

On the complete test set (cf. group `all`<sup>1</sup> in Table 1) the `confdiving` setting can solve seven instances more than SCIP with `default` settings and the time

<sup>1</sup>For 6 instances at least one setting finished with slight numerical violations within  $(1e-6, 1e-4]$ . These instances are excluded.

until the best solution is found can be slightly reduced by 3%. Since an instance is only called solved if all used random seeds solved it, those seven instances are consistently solved by `confdiving`.

Looking into more detailed subsets shows, that on instances that can be solved by at least one settings and where at least one setting needs more than 100 seconds (cf. group  $[100,tilim]$ ) `confdiving` is able to reduce the number of solved nodes and solving time by 7% and 6%, respectively. Further, the primal integral can be reduced by 5%. On hard instances, i.e., one setting needs at least 1000 seconds and at least one setting could solve the instance (cf. group  $[1000,tilim]$ ), SCIP extended by `confdiving` needs 18% fewer nodes, 17% less solving time, and can solve 7 additional instances. Moreover, the primal integral can be reduced by 4%. Considering a measure that also takes the dual bound to account, i.e., the primal-dual integral [4] which improves by 10%, shows that conflict diving has a large impact on the dual bound.

On the MIPLIB2010 benchmark set `confdiving` is able to solve 2 instances more than `default`, namely `ns1758913` and `pw-myciel4`, whereas no instance gets lost, i.e., cannot be solved with at least one seed. On this test set the time until the best solution was found and the primal integral can be improved by 13% and 9%, respectively. Unfortunately, this does not show up in the overall performance, which improved by 3% only. However, `confdiving` is faster by at least 10% on 22 instances, and slower by at least 10% on only 12 instances.

On 136 instances of `MMMC+` conflict diving finds at least one improving solution and reduces the primal integral reduces by 10% on those instances. Applying a variant of the Wilcoxon signed rank test [25] shows that this result is statistically significant with  $p < 0.0007$ . A similar significant result hold on 134 instances of `MMMC+` where `confdiving` finds at least one additional conflict but no improving solution (primal-dual integral  $-6%$ ,  $p < 0.001$ ).

## 4 Conclusion

In this short paper we presented a new approach called *conflict diving* that uses conflict information for improving the primal bound within a MIP solver. Our computational results indicate that conflict diving can improve the performance of a MIP solver. The presented conflict driven diving approach improves, e.g., the solving time, primal integral and time until the best solution was found. On the MIPLIB2010 benchmark set the time until the best solution was found can be reduced by 13% and the primal integral by 9%. Moreover, SCIP extended by conflict diving is able to solve up to 7 more instances. On hard instances the solving time can be improved by 17% when conflict diving is used.

## Acknowledgments

Many thanks to Timo Berthold for his valuable comments and helpful discussions. The work for this article has been conducted within the Research Campus

Modal funded by the German Federal Ministry of Education and Research (fund number 05M14ZAM).

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**Table 2:** Detailed computational results on MIPLIB3 test set. The table shows the absolute and relative numbers of nodes ( $\mathbf{N}$ ,  $\mathbf{N}_Q$ ), solving time ( $\mathbf{T}$ ,  $\mathbf{T}_Q$ ), primal integral ( $\mathbf{PI}$ ,  $\mathbf{PI}_Q$ ), primal-dual integral ( $\mathbf{PDI}$ ,  $\mathbf{PDI}_Q$ ), time to best ( $\mathbf{TtB}$ ,  $\mathbf{TtB}_Q$ ) and first solution ( $\mathbf{TtF}$ ,  $\mathbf{TtF}_Q$ ), and number of conflicts found by conflict diving ( $\mathbf{C}$ ). The right-most column ( $\mathbf{I}$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving														
	N	T	PI	PDI	TtB	TtF	N	$N_Q$	T	$T_Q$	PI	$PI_Q$	PDI	$PDI_Q$	TtB	$TtB_Q$	TtF	$TtF_Q$	C	I	
10teams	211	12	977	975	12	10	594	<i>2.82</i>	18	<i>1.55</i>	1155	<i>1.18</i>	1153	<i>1.18</i>	18	<i>1.55</i>	11	<i>1.17</i>		107	
air03	2	3	73	118	3	< 1	2	<b>0.83</b>	3	<b>0.85</b>	62	<b>0.85</b>	110	<b>0.93</b>	2	<b>0.81</b>	< 1	0.96		6	$\checkmark$
air04	112	47	753	782	45	7	84	<b>0.75</b>	49	1.03	766	1.02	795	1.02	47	1.03	7	1.01		33	
air05	472	39	335	411	37	1	368	<b>0.78</b>	37	<b>0.95</b>	347	1.04	425	1.03	34	<b>0.94</b>	1	1.01		301	
arki001	1238172	6781	1828	1849	2189	18	1278084	1.03	6293	<b>0.93</b>	2373	<i>1.30</i>	2388	<i>1.29</i>	2086	<b>0.95</b>	24	<i>1.30</i>		980	$\checkmark$
bell3a	1008	1	< 1	1	< 1	< 1	630	<b>0.62</b>	1	<b>0.94</b>	< 1	<b>0.84</b>	1	0.96	< 1	<b>0.36</b>	< 1	1.00		33	
bell5	278	1	< 1	2	< 1	< 1	245	<b>0.88</b>	1	1.00	< 1	1.01	2	1.00	< 1	<b>0.67</b>	< 1	1.00		77	$\checkmark$
blend2	286	1	10	14	< 1	< 1	1388	<i>4.85</i>	1	<i>2.69</i>	47	<i>4.71</i>	52	<i>3.84</i>	1	<i>9.86</i>	< 1	<i>3.01</i>		42	
cap6000	2050	4	28	29	3	< 1	2267	<i>1.11</i>	5	<i>1.20</i>	27	0.98	29	1.01	5	<i>1.37</i>	< 1	0.99		2109	$\checkmark$
dano3mip	1190	7200	63114	169654	3839	1	1204	1.01	7200	1.00	65017	1.03	171273	1.01	2985	<b>0.78</b>	1	1.00		28	
danoint	1177174	4398	986	12905	226	7	1155238	0.98	4281	0.97	1432	<i>1.45</i>	13887	<i>1.08</i>	834	<i>3.69</i>	7	<b>0.93</b>		1012	
dcmulti	86	3	46	45	3	< 1	76	<b>0.89</b>	2	<b>0.75</b>	14	<b>0.31</b>	13	<b>0.28</b>	2	<b>0.75</b>	< 1	<b>0.16</b>		68	$\checkmark$
dsbmip	14	2	47	47	2	< 1	12	<b>0.81</b>	2	<b>0.77</b>	47	1.00	49	<i>1.05</i>	2	<b>0.77</b>	< 1	<b>0.95</b>		442	$\checkmark$
egout	1	1	0	1	< 1	< 1	1	1.00	1	1.00	0	<b>0.00</b>	< 1	<b>0.64</b>	< 1	<b>0.73</b>	< 1	1.00		2	$\checkmark$
enigma	440	1	32	32	< 1	< 1	729	<i>1.66</i>	1	1.03	42	<i>1.32</i>	41	<i>1.26</i>	< 1	<i>1.26</i>	< 1	<i>1.33</i>		22	
fast0507	969	252	546	1067	165	< 1	941	0.97	265	<i>1.05</i>	580	<i>1.06</i>	1111	1.04	180	<i>1.09</i>	< 1	1.02		361	
fiber	6	2	26	29	1	< 1	6	0.97	3	<i>1.20</i>	25	0.98	31	1.04	1	<i>1.10</i>	< 1	<i>1.25</i>		268	$\checkmark$
fixnet6	3	6	54	63	4	< 1	2	<b>0.67</b>	5	<b>0.83</b>	55	1.02	63	1.01	4	1.01	< 1	<b>0.89</b>		88	
flugpl	7	1	0	< 1	< 1	< 1	6	<b>0.86</b>	1	1.00	0	<b>0.60</b>	< 1	<b>0.82</b>	< 1	<b>0.72</b>	< 1	1.00		8	$\checkmark$
gen	1	1	0	2	< 1	< 1	1	1.00	1	1.00	0	1.00	2	<i>1.10</i>	< 1	<i>1.05</i>	< 1	1.00		60	$\checkmark$
gesa3	7	4	41	41	4	< 1	8	<i>1.28</i>	7	<i>1.85</i>	9	<b>0.23</b>	7	<b>0.17</b>	7	<i>1.82</i>	< 1	1.00		433	$\checkmark$
gesa3_o	7	3	15	13	3	< 1	8	<i>1.07</i>	6	<i>1.83</i>	11	<b>0.75</b>	9	<b>0.73</b>	6	<i>1.82</i>	< 1	<i>1.07</i>		343	$\checkmark$
gt2	1	1	0	2	< 1	< 1	1	1.00	1	1.00	0	<b>0.00</b>	2	<b>0.89</b>	< 1	<b>0.93</b>	< 1	1.00		0	
khh05250	6	1	1	3	1	< 1	2	<b>0.31</b>	1	<b>0.62</b>	1	0.97	3	1.00	< 1	<b>0.48</b>	< 1	<b>0.89</b>		1126	$\checkmark$
l152lav	38	2	33	34	2	< 1	55	<i>1.43</i>	4	<i>1.67</i>	39	<i>1.19</i>	42	<i>1.24</i>	3	<i>1.87</i>	< 1	<i>1.20</i>		53	$\checkmark$
lseu	202	1	2	7	< 1	< 1	244	<i>1.21</i>	1	<i>1.13</i>	2	<i>1.17</i>	8	<i>1.12</i>	1	<i>1.25</i>	< 1	<i>1.13</i>		113	$\checkmark$
markshare1	27206678	7200	625318	720010	2668	< 1	29498915	<i>1.08</i>	7200	1.00	628679	1.01	720011	1.00	2906	<i>1.09</i>	< 1	1.00		34172	
markshare2	6628319	7200	681328	720023	2937	< 1	6397184	0.97	7200	1.00	681590	1.00	720024	1.00	3188	<i>1.09</i>	< 1	1.00		15791	
mas74	5066734	1367	610	4891	605	< 1	3954752	<b>0.78</b>	1123	<b>0.82</b>	423	<b>0.69</b>	3530	<b>0.72</b>	388	<b>0.64</b>	< 1	1.00		15376	

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**Table 2:** Detailed computational results on MIPLIB3 test set. The table shows the absolute and relative numbers of nodes ( $\mathbf{N}$ ,  $\mathbf{N}_Q$ ), solving time ( $\mathbf{T}$ ,  $\mathbf{T}_Q$ ), primal integral ( $\mathbf{PI}$ ,  $\mathbf{PI}_Q$ ), primal-dual integral ( $\mathbf{PDI}$ ,  $\mathbf{PDI}_Q$ ), time to best ( $\mathbf{TtB}$ ,  $\mathbf{TtB}_Q$ ) and first solution ( $\mathbf{TtF}$ ,  $\mathbf{TtF}_Q$ ), and number of conflicts found by conflict diving ( $\mathbf{C}$ ). The right-most column ( $\mathbf{I}$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving														C	I
	N	T	PI	PDI	TtB	TtF	N	$\mathbf{N}_Q$	T	$\mathbf{T}_Q$	PI	$\mathbf{PI}_Q$	PDI	$\mathbf{PDI}_Q$	TtB	$\mathbf{TtB}_Q$	TtF	$\mathbf{TtF}_Q$				
mas76	250726	98	1	120	< 1	< 1	284959	<i>1.14</i>	106	<i>1.09</i>	1	1.00	135	<i>1.13</i>	< 1	<b>0.95</b>	< 1	1.00	3659			
misc03	47	1	17	39	< 1	< 1	98	<i>2.08</i>	1	<i>1.26</i>	7	<b>0.39</b>	39	1.00	< 1	<b>0.74</b>	< 1	<b>0.28</b>	83	$\checkmark$		
misc06	4	1	5	7	< 1	< 1	4	<b>0.85</b>	1	1.03	8	<i>1.65</i>	8	<i>1.14</i>	< 1	<i>1.07</i>	< 1	<i>1.15</i>	670			
misc07	23151	27	33	718	13	< 1	21288	<b>0.92</b>	25	<b>0.93</b>	27	<b>0.80</b>	670	<b>0.93</b>	9	<b>0.67</b>	< 1	<b>0.32</b>	110	$\checkmark$		
mitre	1	13	1212	1216	13	12	1	<i>1.17</i>	13	1.01	1212	1.00	1215	1.00	13	1.01	12	1.00	67	$\checkmark$		
mod008	2	1	< 1	2	< 1	< 1	3	<i>1.23</i>	1	0.99	< 1	0.96	2	0.96	< 1	0.97	< 1	1.00	61			
mod010	2	1	30	29	< 1	< 1	2	1.00	1	<i>1.31</i>	28	<b>0.93</b>	29	0.98	1	<i>1.26</i>	< 1	<b>0.95</b>	161	$\checkmark$		
mod011	1281	291	1505	2198	238	< 1	1306	1.02	298	1.03	1518	1.01	2227	1.01	240	1.01	< 1	1.00	1			
modglob	2	1	< 1	1	< 1	< 1	3	<i>1.33</i>	1	<i>1.14</i>	< 1	0.98	1	1.00	< 1	1.04	< 1	1.00	1376	$\checkmark$		
noswot	317847	100	5	471	41	< 1	225645	<b>0.71</b>	71	<b>0.71</b>	0	<b>0.00</b>	328	<b>0.70</b>	< 1	<b>0.00</b>	< 1	<b>0.86</b>	996	$\checkmark$		
nw04	6	64	3420	3846	59	8	6	<i>1.09</i>	66	1.03	3398	0.99	3825	0.99	59	1.00	8	0.99	15			
p0033	2	1	< 1	< 1	< 1	< 1	1	<b>0.55</b>	1	1.00	0	<b>0.00</b>	< 1	1.03	< 1	<b>0.33</b>	< 1	1.00	59	$\checkmark$		
p0201	68	1	10	15	1	< 1	13	<b>0.19</b>	1	<b>0.86</b>	8	<b>0.81</b>	13	<b>0.87</b>	1	<b>0.87</b>	< 1	<i>1.22</i>	49	$\checkmark$		
p0282	2	1	1	3	< 1	< 1	2	<b>0.92</b>	1	1.00	1	<i>1.07</i>	3	<b>0.90</b>	< 1	0.97	< 1	1.00	4			
p0548	1	1	7	8	< 1	< 1	1	<i>1.17</i>	1	1.00	8	<i>1.16</i>	8	1.04	< 1	<i>1.37</i>	< 1	<b>0.88</b>	67	$\checkmark$		
p2756	14	3	42	45	3	< 1	13	<b>0.92</b>	4	<i>1.21</i>	40	<b>0.95</b>	45	0.98	4	<i>1.21</i>	< 1	0.97	65	$\checkmark$		
pk1	333688	131	801	6871	33	< 1	316674	<b>0.95</b>	127	0.98	683	<b>0.85</b>	6571	0.96	34	1.02	< 1	1.00	535			
pp08a	282	2	38	40	2	< 1	253	<b>0.90</b>	2	0.98	39	1.03	41	1.03	2	0.98	< 1	1.00	60	$\checkmark$		
pp08aCUTS	237	2	33	35	2	< 1	220	<b>0.93</b>	2	0.97	33	1.00	35	0.99	2	0.96	< 1	1.00	47			
qiu	10040	71	2198	4905	45	< 1	11018	<i>1.10</i>	76	<i>1.07</i>	1898	<b>0.86</b>	5203	<i>1.06</i>	25	<b>0.56</b>	< 1	<i>1.08</i>	23	$\checkmark$		
qnet1	21	4	88	92	4	< 1	22	<i>1.08</i>	4	1.02	88	1.00	93	1.00	4	1.01	< 1	1.00	4			
qnet1_o	9	2	41	46	2	< 1	8	<b>0.92</b>	2	0.99	42	1.02	47	1.02	2	0.99	< 1	1.00	1			
rentacar	3	2	84	89	2	1	5	<i>1.50</i>	2	<i>1.10</i>	86	1.02	90	1.01	2	<b>0.90</b>	1	1.00	6522	$\checkmark$		
rgn	1	1	15	15	< 1	< 1	1	1.00	1	1.00	15	1.00	16	1.04	< 1	1.04	< 1	1.00	9			
rout	15735	69	214	482	27	< 1	14451	<b>0.92</b>	62	<b>0.90</b>	195	<b>0.91</b>	479	0.99	28	1.03	< 1	<i>1.06</i>	283	$\checkmark$		
set1ch	1	1	11	13	< 1	< 1	2	<i>1.50</i>	1	<i>1.28</i>	12	1.03	14	<i>1.06</i>	1	<i>1.23</i>	< 1	<i>1.12</i>	85	$\checkmark$		
seymour	210806	7200	1715	12269	3555	< 1	209922	1.00	7200	1.00	1743	1.02	12536	1.02	3889	<i>1.09</i>	< 1	<b>0.86</b>	770			
stein27	2681	1	0	23	< 1	< 1	2778	1.04	1	<b>0.89</b>	0	<b>0.00</b>	23	0.98	< 1	<b>0.93</b>	< 1	1.00	138			
stein45	40030	16	6	247	2	< 1	40763	1.02	16	0.99	7	<i>1.23</i>	249	1.01	2	<i>1.23</i>	< 1	1.00	478	$\checkmark$		
swath	919716	7200	24996	117779	5359	< 1	865503	<b>0.94</b>	7200	1.00	19609	<b>0.78</b>	118284	1.00	5596	1.04	< 1	<b>0.93</b>	4180			

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**Table 2:** Detailed computational results on MIPLIB3 test set. The table shows the absolute and relative numbers of nodes ( $\mathbf{N}$ ,  $\mathbf{N}_Q$ ), solving time ( $\mathbf{T}$ ,  $\mathbf{T}_Q$ ), primal integral ( $\mathbf{PI}$ ,  $\mathbf{PI}_Q$ ), primal-dual integral ( $\mathbf{PDI}$ ,  $\mathbf{PDI}_Q$ ), time to best ( $\mathbf{TtB}$ ,  $\mathbf{TtB}_Q$ ) and first solution ( $\mathbf{TtF}$ ,  $\mathbf{TtF}_Q$ ), and number of conflicts found by conflict diving ( $\mathbf{C}$ ). The right-most column ( $\mathbf{I}$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving													$\mathbf{C}$	$\mathbf{I}$
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$			
vpm1	1	1	0	< 1	< 1	< 1	1	1.00	1	1.00	0	<b>0.00</b>	1	<i>1.90</i>	< 1	1.00	< 1	1.00	0		
vpm2	162	2	14	23	1	< 1	362	<i>2.23</i>	2	<i>1.22</i>	28	<i>1.95</i>	38	<i>1.64</i>	2	<i>2.53</i>	< 1	<i>1.14</i>	29		
geom.	202.49	8.32	–	88.58	3.21	0.06	204.43	1.01	8.70	1.04	–	–	87.12	0.98	2.91	0.90	0.06	0.97	–		
shgeom.	1016.57	12.30	88.15	154.31	7.42	0.39	1049.29	1.03	12.68	1.03	86.38	0.98	153.27	0.99	7.29	0.98	0.39	1.01	146.49		



**Table 3:** Detailed computational results on MIPLIB2003 test set. The table shows the absolute and relative numbers of nodes ( $\mathbf{N}$ ,  $\mathbf{N}_Q$ ), solving time ( $\mathbf{T}$ ,  $\mathbf{T}_Q$ ), primal integral ( $\mathbf{PI}$ ,  $\mathbf{PI}_Q$ ), primal-dual integral ( $\mathbf{PDI}$ ,  $\mathbf{PDI}_Q$ ), time to best ( $\mathbf{TtB}$ ,  $\mathbf{TtB}_Q$ ) and first solution ( $\mathbf{TtF}$ ,  $\mathbf{TtF}_Q$ ), and number of conflicts found by conflict diving ( $\mathbf{C}$ ). The right-most column ( $\mathbf{I}$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving													C	I
	N	T	PI	PDI	TtB	TtF	N	$N_Q$	T	$T_Q$	PI	$PI_Q$	PDI	$PDI_Q$	TtB	$TtB_Q$	TtF	$TtF_Q$			
10teams	211	12	977	975	12	10	594	<i>2.82</i>	18	<i>1.55</i>	1155	<i>1.18</i>	1153	<i>1.18</i>	18	<i>1.55</i>	11	<i>1.17</i>	107		
alc1s1	192312	7200	4920	32659	4101	< 1	172966	<b>0.90</b>	7200	1.00	4726	0.96	32875	1.01	3893	<b>0.95</b>	< 1	0.97	187 $\checkmark$		
aflow30a	648	18	388	438	9	< 1	714	<i>1.10</i>	21	<i>1.13</i>	147	<b>0.38</b>	216	<b>0.49</b>	14	<i>1.63</i>	< 1	1.02	94 $\checkmark$		
aflow40b	18333	712	3835	5934	462	< 1	23098	<i>1.26</i>	659	<b>0.93</b>	3008	<b>0.78</b>	4928	<b>0.83</b>	442	0.96	< 1	1.04	457 $\checkmark$		
air04	112	47	753	782	45	7	84	<b>0.75</b>	49	1.03	766	1.02	795	1.02	47	1.03	7	1.01	33		
air05	472	39	335	411	37	1	368	<b>0.78</b>	37	<b>0.95</b>	347	1.04	425	1.03	34	<b>0.94</b>	1	1.01	301		
arki001	1238172	6781	1828	1849	2189	18	1278084	1.03	6293	<b>0.93</b>	2373	<i>1.30</i>	2388	<i>1.29</i>	2086	<b>0.95</b>	24	<i>1.30</i>	980 $\checkmark$		
atlanta-ip	12096	7200	63299	96097	5121	388	13128	<i>1.09</i>	7200	1.00	48837	<b>0.77</b>	76526	<b>0.80</b>	3853	<b>0.75</b>	239	<b>0.62</b>	1099		
cap6000	2050	4	28	29	3	< 1	2267	<i>1.11</i>	5	<i>1.20</i>	27	0.98	29	1.01	5	<i>1.37</i>	< 1	0.99	2109 $\checkmark$		
dano3mip	1190	7200	63114	169654	3839	1	1204	1.01	7200	1.00	65017	1.03	171273	1.01	2985	<b>0.78</b>	1	1.00	28		
danoint	1177174	4398	986	12905	226	7	1155238	0.98	4281	0.97	1432	<i>1.45</i>	13887	<i>1.08</i>	834	<i>3.69</i>	7	<b>0.93</b>	1012		
disctom	1	11	1125	1125	11	11	1	1.00	11	1.00	1127	1.00	1127	1.00	11	1.00	11	1.00	0		
ds	860	7200	572866	628313	2879	4	837	0.97	7200	1.00	573237	1.00	628562	1.00	2954	1.03	5	<i>1.05</i>	0		
fast0507	969	252	546	1067	165	< 1	941	0.97	265	<i>1.05</i>	580	<i>1.06</i>	1111	1.04	180	<i>1.09</i>	< 1	1.02	361		
fiber	6	2	26	29	1	< 1	6	0.97	3	<i>1.20</i>	25	0.98	31	1.04	1	<i>1.10</i>	< 1	<i>1.25</i>	268 $\checkmark$		
fixnet6	3	6	54	63	4	< 1	2	<b>0.67</b>	5	<b>0.83</b>	55	1.02	63	1.01	4	1.01	< 1	<b>0.89</b>	88		
gesa2-o	3	1	12	10	< 1	< 1	2	<b>0.69</b>	1	1.00	12	1.03	10	<i>1.05</i>	< 1	1.04	< 1	1.02	107 $\checkmark$		
glass4	1400467	4558	109756	129350	4427	< 1	1319902	<b>0.94</b>	4971	<i>1.09</i>	116911	<i>1.07</i>	138200	<i>1.07</i>	4847	<i>1.09</i>	< 1	<i>1.06</i>	22999 $\checkmark$		
liu	999658	7200	58684	392849	5588	< 1	801000	<b>0.80</b>	7200	1.00	53488	<b>0.91</b>	390277	0.99	4246	<b>0.76</b>	< 1	<i>1.35</i>	1069 $\checkmark$		
manna81	1	1	12	14	1	< 1	1	1.00	1	0.99	10	<b>0.88</b>	13	0.97	1	0.99	< 1	1.00	1		
markshare1	27206678	7200	625318	720010	2668	< 1	29498915	<i>1.08</i>	7200	1.00	628679	1.01	720011	1.00	2906	<i>1.09</i>	< 1	1.00	34172		
markshare2	6628319	7200	681328	720023	2937	< 1	6397184	0.97	7200	1.00	681590	1.00	720024	1.00	3188	<i>1.09</i>	< 1	1.00	15791		
mas74	5066734	1367	610	4891	605	< 1	3954752	<b>0.78</b>	1123	<b>0.82</b>	423	<b>0.69</b>	3530	<b>0.72</b>	388	<b>0.64</b>	< 1	1.00	15376		
mas76	250726	98	1	120	< 1	< 1	284959	<i>1.14</i>	106	<i>1.09</i>	1	1.00	135	<i>1.13</i>	< 1	<b>0.95</b>	< 1	1.00	3659		
misc07	23151	27	33	718	13	< 1	21288	<b>0.92</b>	25	<b>0.93</b>	27	<b>0.80</b>	670	<b>0.93</b>	9	<b>0.67</b>	< 1	<b>0.32</b>	110 $\checkmark$		
mkc	689644	7200	2596	3781	2352	< 1	690327	1.00	7200	1.00	3250	<i>1.25</i>	4491	<i>1.19</i>	4244	<i>1.80</i>	< 1	1.00	373		
mod011	1281	291	1505	2198	238	< 1	1306	1.02	298	1.03	1518	1.01	2227	1.01	240	1.01	< 1	1.00	1		
modglob	2	1	< 1	1	< 1	< 1	3	<i>1.33</i>	1	<i>1.14</i>	< 1	0.98	1	1.00	< 1	1.04	< 1	1.00	1376 $\checkmark$		
momentum1	136132	7200	53411	98553	4333	6	134785	0.99	7200	1.00	52621	0.99	92641	<b>0.94</b>	5780	<i>1.33</i>	6	0.99	1217		

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Instance	default						confdiving													
	N	T	PI	PDI	TtB	TtF	N	$N_Q$	T	$T_Q$	PI	$PI_Q$	PDI	$PDI_Q$	TtB	$TtB_Q$	TtF	$TtF_Q$	C	I
momentum3	390	7200	326157	562398	5612	206	330	<b>0.84</b>	7200	1.00	336598	1.03	566593	1.01	4459	<b>0.79</b>	225	<i>1.09</i>	252	
msec98-ip	7657	7200	79841	84199	5535	216	14749	<i>1.93</i>	6536	<b>0.91</b>	93202	<i>1.17</i>	96622	<i>1.15</i>	5048	<b>0.91</b>	531	<i>2.46</i>	1082	
mzzv11	2138	366	11483	11647	294	< 1	3350	<i>1.57</i>	525	<i>1.44</i>	12409	<i>1.08</i>	12670	<i>1.09</i>	417	<i>1.42</i>	< 1	<b>0.94</b>	60	$\checkmark$
mzzv42z	317	201	9152	9239	190	< 1	543	<i>1.71</i>	222	<i>1.11</i>	8885	0.97	9005	0.97	214	<i>1.13</i>	< 1	<i>1.18</i>	68	$\checkmark$
net12	2161	1479	15201	72698	402	93	2153	1.00	1464	0.99	14582	0.96	59822	<b>0.82</b>	254	<b>0.63</b>	112	<i>1.20</i>	497	$\checkmark$
noswot	317847	100	5	471	41	< 1	225645	<b>0.71</b>	71	<b>0.71</b>	0	<b>0.00</b>	328	<b>0.70</b>	< 1	<b>0.00</b>	< 1	<b>0.86</b>	996	$\checkmark$
nsrand-ipx	34821	433	1722	2108	362	1	43136	<i>1.24</i>	474	<i>1.09</i>	1608	<b>0.93</b>	2032	0.96	400	<i>1.10</i>	1	1.00	122	$\checkmark$
nw04	6	64	3420	3846	59	8	6	<i>1.09</i>	66	1.03	3398	0.99	3825	0.99	59	1.00	8	0.99	15	
opt1217	1	1	1	4	< 1	< 1	1	1.00	1	1.00	< 1	<b>0.21</b>	5	1.04	< 1	<b>0.69</b>	< 1	1.00	36	
p2756	14	3	42	45	3	< 1	13	<b>0.92</b>	4	<i>1.21</i>	40	<b>0.95</b>	45	0.98	4	<i>1.21</i>	< 1	0.97	65	$\checkmark$
pk1	333688	131	801	6871	33	< 1	316674	<b>0.95</b>	127	0.98	683	<b>0.85</b>	6571	0.96	34	1.02	< 1	1.00	535	
pp08a	282	2	38	40	2	< 1	253	<b>0.90</b>	2	0.98	39	1.03	41	1.03	2	0.98	< 1	1.00	60	$\checkmark$
pp08aCUTS	237	2	33	35	2	< 1	220	<b>0.93</b>	2	0.97	33	1.00	35	0.99	2	0.96	< 1	1.00	47	
protfold	12280	7200	288197	360755	3721	< 1	12028	0.98	7200	1.00	307512	<i>1.07</i>	377307	<i>1.05</i>	4595	<i>1.23</i>	< 1	0.99	1381	
qiu	10040	71	2198	4905	45	< 1	11018	<i>1.10</i>	76	<i>1.07</i>	1898	<b>0.86</b>	5203	<i>1.06</i>	25	<b>0.56</b>	< 1	<i>1.08</i>	23	$\checkmark$
rd-rplusc-21	315235	7200	94808	719622	3436	850	555499	<i>1.76</i>	7200	1.00	29323	<b>0.31</b>	719583	1.00	2535	<b>0.74</b>	243	<b>0.29</b>	286	
roll3000	3357	69	597	703	59	4	3311	0.99	64	<b>0.94</b>	606	1.01	709	1.01	53	<b>0.90</b>	4	<i>1.14</i>	199	
rout	15735	69	214	482	27	< 1	14451	<b>0.92</b>	62	<b>0.90</b>	195	<b>0.91</b>	479	0.99	28	1.03	< 1	<i>1.06</i>	283	$\checkmark$
set1ch	1	1	11	13	< 1	< 1	2	<i>1.50</i>	1	<i>1.28</i>	12	1.03	14	<i>1.06</i>	1	<i>1.23</i>	< 1	<i>1.12</i>	85	$\checkmark$
seymour	210806	7200	1715	12269	3555	< 1	209922	1.00	7200	1.00	1743	1.02	12536	1.02	3889	<i>1.09</i>	< 1	<b>0.86</b>	770	
sp97ar	21186	7200	118749	715977	6175	1	19648	<b>0.93</b>	7200	1.00	123306	1.04	716007	1.00	4965	<b>0.80</b>	1	0.97	317	
stp3d	21	7200	720166	720166	7200	7200	17	<b>0.84</b>	7200	1.00	721142	1.00	721142	1.00	7200	1.00	7200	1.00	105	
swath	919716	7200	24996	117779	5359	< 1	865503	<b>0.94</b>	7200	1.00	19609	<b>0.78</b>	118284	1.00	5596	1.04	< 1	<b>0.93</b>	4180	
t1717	3536	7200	197784	301446	2859	5	3489	0.99	7200	1.00	195477	<b>0.99</b>	299533	0.99	2678	<b>0.94</b>	5	0.99	183	
timtab1	58161	82	677	1478	57	3	51476	<b>0.89</b>	70	<b>0.86</b>	456	<b>0.67</b>	1242	<b>0.84</b>	47	<b>0.82</b>	2	<b>0.72</b>	248	$\checkmark$
timtab2	2793595	7200	14581	41134	3729	18	2811514	1.01	7200	1.00	12726	<b>0.87</b>	34633	<b>0.84</b>	3098	<b>0.83</b>	20	<i>1.12</i>	3685	
tr12-30	390234	672	46	103	154	< 1	619085	<i>1.59</i>	1003	<i>1.49</i>	48	1.04	125	<i>1.21</i>	124	<b>0.81</b>	< 1	<b>0.94</b>	698	$\checkmark$
vpm2	162	2	14	23	1	< 1	362	<i>2.23</i>	2	<i>1.22</i>	28	<i>1.95</i>	38	<i>1.64</i>	2	<i>2.53</i>	< 1	<i>1.14</i>	29	
geom.	4051.59	223.42	1413.26	3261.25	114.43	0.33	4254.31	1.05	229.26	1.03	-	-	3238.03	0.99	100.97	0.88	0.32	0.98	-	

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**Table 3:** Detailed computational results on MIPLIB2003 test set. The table shows the absolute and relative numbers of nodes ( $\mathbf{N}$ ,  $\mathbf{N}_Q$ ), solving time ( $\mathbf{T}$ ,  $\mathbf{T}_Q$ ), primal integral ( $\mathbf{PI}$ ,  $\mathbf{PI}_Q$ ), primal-dual integral ( $\mathbf{PDI}$ ,  $\mathbf{PDI}_Q$ ), time to best ( $\mathbf{TtB}$ ,  $\mathbf{TtB}_Q$ ) and first solution ( $\mathbf{TtF}$ ,  $\mathbf{TtF}_Q$ ), and number of conflicts found by conflict diving ( $\mathbf{C}$ ). The right-most column ( $\mathbf{I}$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving											$\mathbf{C}$	$\mathbf{I}$		
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$			$\mathbf{TtF}_Q$	
shgeom.	8491.86	256.22	1851.12	3731.79	144.80	2.25	8911.00	1.05	261.10	1.02	1754.00	0.95	3692.46	0.99	137.75	0.95	2.23	0.99	287.70		

**Table 4:** Detailed computational results on MIPLIB2010 benchmark set. The table shows the absolute and relative numbers of nodes ( $N$ ,  $N_Q$ ), solving time ( $T$ ,  $T_Q$ ), primal integral ( $PI$ ,  $PI_Q$ ), primal-dual integral ( $PDI$ ,  $PDI_Q$ ), time to best ( $TtB$ ,  $TtB_Q$ ) and first solution ( $TtF$ ,  $TtF_Q$ ), and number of conflicts found by conflict diving ( $C$ ). The right-most column ( $I$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving														C	I
	N	T	PI	PDI	TtB	TtF	N	$N_Q$	T	$T_Q$	PI	$PI_Q$	PDI	$PDI_Q$	TtB	$TtB_Q$	TtF	$TtF_Q$				
30n20b8	1133	443	19130	30492	400	103	1721	<i>1.52</i>	359	<b>0.81</b>	16077	<b>0.84</b>	25307	<b>0.83</b>	315	<b>0.79</b>	83	<b>0.80</b>	106	$\checkmark$		
acc-tight5	421	94	9448	9449	94	85	356	<b>0.84</b>	90	<b>0.95</b>	8967	<b>0.95</b>	8981	<b>0.95</b>	90	<b>0.95</b>	90	<i>1.05</i>	144			
aflow40b	18333	712	3835	5934	462	< 1	23098	<i>1.26</i>	659	<b>0.93</b>	3008	<b>0.78</b>	4928	<b>0.83</b>	442	0.96	< 1	1.04	457	$\checkmark$		
air04	112	47	753	782	45	7	84	<b>0.75</b>	49	1.03	766	1.02	795	1.02	47	1.03	7	1.01	33			
app1-2	79	764	32647	50714	666	157	34	<b>0.43</b>	707	<b>0.93</b>	31071	<b>0.95</b>	47359	<b>0.93</b>	526	<b>0.79</b>	151	0.97	99			
ash608gpia-3col	14	40	3951	720000	7200	7200	1	<b>0.07</b>	30	<b>0.76</b>	3003	<b>0.76</b>	720000	1.00	7200	1.00	7200	1.00	37			
bab5	65097	7200	16291	22852	4101	148	76156	<i>1.17</i>	7200	1.00	15750	0.97	21884	0.96	5277	<i>1.29</i>	145	0.98	1545			
beasleyC3	524	59	411	493	58	< 1	515	0.98	56	0.96	400	0.97	487	0.99	54	<b>0.93</b>	< 1	<i>1.20</i>	300			
biella1	7962	1262	4391	4502	1234	1	6312	<b>0.79</b>	1166	<b>0.92</b>	4290	0.98	4398	0.98	1130	<b>0.92</b>	1	1.04	765			
bienst2	69421	637	1005	10700	259	< 1	59356	<b>0.86</b>	511	<b>0.80</b>	453	<b>0.45</b>	9178	<b>0.86</b>	157	<b>0.61</b>	< 1	<i>1.29</i>	257	$\checkmark$		
binkar10_1	2505	32	39	48	17	< 1	3200	<i>1.28</i>	42	<i>1.31</i>	29	<b>0.74</b>	42	<b>0.88</b>	16	<b>0.93</b>	< 1	<b>0.80</b>	3012	$\checkmark$		
bley_xll	17	206	18289	18358	206	175	1	<b>0.07</b>	206	1.00	18743	1.02	18792	1.02	206	1.00	181	1.04	40	$\checkmark$		
bnatt350	7359	852	85217	85212	852	852	5971	<b>0.81</b>	708	<b>0.83</b>	70850	<b>0.83</b>	70823	<b>0.83</b>	708	<b>0.83</b>	708	<b>0.83</b>	1564			
core2536-691	319	361	656	1119	361	1	354	<i>1.11</i>	370	1.03	696	<i>1.06</i>	1160	1.04	370	1.03	1	1.01	0			
cov1075	2229092	5233	155	42458	104	< 1	2134407	0.96	4881	<b>0.93</b>	110	<b>0.71</b>	39423	<b>0.93</b>	68	<b>0.65</b>	< 1	1.00	1203			
csched010	211937	3923	8121	26258	844	50	225756	<i>1.07</i>	4284	<i>1.09</i>	8189	1.01	29820	<i>1.14</i>	943	<i>1.12</i>	45	<b>0.90</b>	922			
danoint	1177174	4398	986	12905	226	7	1155238	0.98	4281	0.97	1432	<i>1.45</i>	13887	<i>1.08</i>	834	<i>3.69</i>	7	<b>0.93</b>	1012			
dfn-gwin-UUM	21127	107	466	960	25	< 1	27429	<i>1.30</i>	125	<i>1.16</i>	317	<b>0.68</b>	878	<b>0.91</b>	28	<i>1.13</i>	< 1	<i>1.07</i>	2338	$\checkmark$		
eil33-2	718	84	585	1415	75	< 1	718	1.00	84	1.00	584	1.00	1415	1.00	75	1.00	< 1	0.97	0			
eilB101	32681	509	1838	4968	408	< 1	22455	<b>0.69</b>	385	<b>0.76</b>	1241	<b>0.68</b>	3690	<b>0.74</b>	278	<b>0.68</b>	< 1	1.02	9			
enlight13	1	1	0	2	< 1	< 1	1	1.00	1	1.00	0	<b>0.00</b>	1	<b>0.64</b>	< 1	<b>0.73</b>	< 1	<b>0.73</b>	0			
enlight14	1	1	2	720000	7200	7200	1	1.00	1	1.00	2	<b>0.83</b>	720000	1.00	7200	1.00	7200	1.00	0			
ex9	1	35	3457	3457	35	35	1	1.00	35	1.00	3475	1.01	3474	1.00	35	1.00	35	1.00	0			
glass4	1400467	4558	109756	129350	4427	< 1	1319902	<b>0.94</b>	4971	<i>1.09</i>	116911	<i>1.07</i>	138200	<i>1.07</i>	4847	<i>1.09</i>	< 1	<i>1.06</i>	22999	$\checkmark$		
gmu-35-40	2194641	7200	200	249	2266	< 1	2845684	<i>1.30</i>	7200	1.00	190	<b>0.95</b>	247	0.99	2792	<i>1.23</i>	< 1	1.00	2193			
iis-100-0-cov	100588	717	199	11399	19	< 1	99583	0.99	765	<i>1.07</i>	217	<i>1.09</i>	12224	<i>1.07</i>	19	1.02	< 1	1.00	794			
iis-bupa-cov	175247	2496	503	24896	82	< 1	178672	1.02	2528	1.01	543	<i>1.08</i>	25265	1.01	97	<i>1.18</i>	< 1	1.00	288			
iis-pima-cov	8692	418	644	4809	132	< 1	7914	<b>0.91</b>	402	0.96	578	<b>0.90</b>	4674	0.97	110	<b>0.83</b>	< 1	<i>1.14</i>	13			
lectsched-4-obj	777	24	1960	1963	24	8	625	<b>0.80</b>	18	<b>0.72</b>	1316	<b>0.67</b>	1315	<b>0.67</b>	18	<b>0.72</b>	3	<b>0.40</b>	61	$\checkmark$		

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Instance	default						confdiving													
	N	T	PI	PDI	TtB	TtF	N	$N_Q$	T	$T_Q$	PI	$PI_Q$	PDI	$PDI_Q$	TtB	$TtB_Q$	TtF	$TtF_Q$	C	I
m100n500k4r1	4915772	7200	28974	28982	36	< 1	4818432	0.98	7200	1.00	28971	1.00	28979	1.00	35	0.98	< 1	1.00	23	
macrophage	558206	6631	2168	49564	2150	< 1	382837	<b>0.69</b>	6367	0.96	1640	<b>0.76</b>	45134	<b>0.91</b>	1328	<b>0.62</b>	< 1	1.00	910	
map18	262	306	1785	3522	55	2	281	<i>1.08</i>	280	<b>0.91</b>	1740	0.97	3374	0.96	75	<i>1.37</i>	2	1.00	14	
map20	258	275	1080	2390	81	2	246	<b>0.95</b>	262	<b>0.95</b>	1085	1.00	2374	0.99	55	<b>0.68</b>	2	1.01	8	
mcsched	16226	356	151	2203	228	< 1	16328	1.01	286	<b>0.80</b>	140	<b>0.93</b>	1750	<b>0.79</b>	161	<b>0.70</b>	< 1	1.04	21	$\checkmark$
mik-250-1-100-1	28660	87	37	188	1	< 1	32272	<i>1.13</i>	96	<i>1.10</i>	34	<b>0.92</b>	202	<i>1.08</i>	1	0.99	< 1	1.00	51	
mine-166-5	2037	62	3067	3326	61	< 1	2974	<i>1.46</i>	61	0.99	3045	0.99	3311	1.00	60	0.98	< 1	<i>1.33</i>	435	
mine-90-10	38761	365	2470	2690	307	< 1	54451	<i>1.40</i>	587	<i>1.61</i>	3263	<i>1.32</i>	3567	<i>1.33</i>	496	<i>1.62</i>	< 1	1.00	2806	
msc98-ip	7657	7200	79841	84199	5535	216	14749	<i>1.93</i>	6536	<b>0.91</b>	93202	<i>1.17</i>	96622	<i>1.15</i>	5048	<b>0.91</b>	531	<i>2.46</i>	1082	
mspp16	54	2272	72169	81463	1444	721	85	<i>1.57</i>	2465	<i>1.09</i>	73235	1.01	83073	1.02	1730	<i>1.20</i>	731	1.01	5	
mzzv11	2138	366	11483	11647	294	< 1	3350	<i>1.57</i>	525	<i>1.44</i>	12409	<i>1.08</i>	12670	<i>1.09</i>	417	<i>1.42</i>	< 1	<b>0.94</b>	60	$\checkmark$
n3div36	212580	7200	6230	31991	748	1	205746	0.97	7200	1.00	6659	<i>1.07</i>	32529	1.02	2320	<i>3.10</i>	1	1.03	593	
n3seq24	798	7200	281752	284494	5738	18	756	<b>0.95</b>	7200	1.00	292996	1.04	295759	1.04	5922	1.03	19	<i>1.08</i>	4357	
n4-3	2965	189	1008	2019	108	< 1	3401	<i>1.15</i>	205	<i>1.09</i>	1085	<i>1.08</i>	2344	<i>1.16</i>	109	1.02	< 1	0.98	1610	$\checkmark$
neos-1109824	6851	101	615	1082	19	5	5825	<b>0.85</b>	79	<b>0.78</b>	333	<b>0.54</b>	668	<b>0.62</b>	13	<b>0.71</b>	2	<b>0.32</b>	252	$\checkmark$
neos-1337307	547670	7200	8981	9618	1068	90	562102	1.03	7200	1.00	8220	<b>0.92</b>	8704	<b>0.90</b>	222	<b>0.21</b>	82	<b>0.91</b>	2853	
neos-1396125	40507	349	3562	9858	164	29	49225	<i>1.22</i>	360	1.03	2451	<b>0.69</b>	8666	<b>0.88</b>	177	<i>1.08</i>	24	<b>0.81</b>	309	$\checkmark$
neos-1601936	10958	5705	466880	466878	4302	615	16363	<i>1.49</i>	6081	<i>1.07</i>	453103	0.97	453113	0.97	5706	<i>1.33</i>	438	<b>0.71</b>	3388	
neos-476283	517	177	1454	3932	148	14	671	<i>1.30</i>	181	1.02	1454	1.00	3933	1.00	164	<i>1.11</i>	14	1.01	11249	$\checkmark$
neos-686190	8949	127	1817	2923	114	4	6792	<b>0.76</b>	111	<b>0.87</b>	1579	<b>0.87</b>	2654	<b>0.91</b>	91	<b>0.79</b>	< 1	<b>0.04</b>	650	
neos-849702	19129	457	45692	45680	457	457	24138	<i>1.26</i>	554	<i>1.21</i>	55383	<i>1.21</i>	55392	<i>1.21</i>	554	<i>1.21</i>	554	<i>1.21</i>	453	
neos-916792	119285	971	2478	7968	290	13	147959	<i>1.24</i>	1193	<i>1.23</i>	2588	1.04	10161	<i>1.28</i>	392	<i>1.35</i>	13	0.98	99	
neos-934278	1254	7200	348201	348917	4801	< 1	661	<b>0.53</b>	7200	1.00	405372	<i>1.16</i>	405996	<i>1.16</i>	2940	<b>0.61</b>	< 1	<b>0.89</b>	141	
neos13	18492	339	3134	7756	280	1	54026	<i>2.92</i>	826	<i>2.44</i>	3194	1.02	16541	<i>2.13</i>	701	<i>2.50</i>	1	1.00	178	$\checkmark$
neos18	1338	29	120	485	9	< 1	1090	<b>0.81</b>	24	<b>0.82</b>	124	1.04	429	<b>0.88</b>	11	<i>1.18</i>	< 1	<i>1.16</i>	253	$\checkmark$
net12	2161	1479	15201	72698	402	93	2153	1.00	1464	0.99	14582	0.96	59822	<b>0.82</b>	254	<b>0.63</b>	112	<i>1.20</i>	497	$\checkmark$
netdiversion	76	1890	94015	96955	1601	41	84	<i>1.11</i>	1317	<b>0.70</b>	76615	<b>0.81</b>	78371	<b>0.81</b>	1026	<b>0.64</b>	41	0.98	191	
newdano	1307144	6819	5482	130091	2922	< 1	1390208	<i>1.06</i>	6909	1.01	6164	<i>1.12</i>	144565	<i>1.11</i>	3718	<i>1.27</i>	< 1	<i>1.29</i>	859	$\checkmark$
noswot	317847	100	5	471	41	< 1	225645	<b>0.71</b>	71	<b>0.71</b>	0	<b>0.00</b>	328	<b>0.70</b>	< 1	<b>0.00</b>	< 1	<b>0.86</b>	996	$\checkmark$
ns1208400	2631	1404	139067	140445	1391	1391	3481	<i>1.32</i>	916	<b>0.65</b>	89933	<b>0.65</b>	91579	<b>0.65</b>	899	<b>0.65</b>	899	<b>0.65</b>	783	

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**Table 4:** Detailed computational results on MIPLIB2010 benchmark set. The table shows the absolute and relative numbers of nodes ( $N$ ,  $N_Q$ ), solving time ( $T$ ,  $T_Q$ ), primal integral ( $PI$ ,  $PI_Q$ ), primal-dual integral ( $PDI$ ,  $PDI_Q$ ), time to best ( $TtB$ ,  $TtB_Q$ ) and first solution ( $TtF$ ,  $TtF_Q$ ), and number of conflicts found by conflict diving ( $C$ ). The right-most column ( $I$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving													
	N	T	PI	PDI	TtB	TtF	N	$N_Q$	T	$T_Q$	PI	$PI_Q$	PDI	$PDI_Q$	TtB	$TtB_Q$	TtF	$TtF_Q$	C	I
ns1688347	3898	188	7748	9152	149	67	2143	<b>0.55</b>	148	<b>0.79</b>	6035	<b>0.78</b>	7177	<b>0.78</b>	127	<b>0.85</b>	52	<b>0.77</b>	624	
ns1758913	24	2499	175606	176583	1321	121	1	<b>0.04</b>	1459	<b>0.58</b>	104102	<b>0.59</b>	105036	<b>0.59</b>	1459	<i>1.10</i>	123	1.02	48	$\checkmark$
ns1766074	992681	2365	236514	720000	7200	7200	1000176	1.01	2301	0.97	230129	0.97	720000	1.00	7200	1.00	7200	1.00	729	
ns1830653	9104	182	4765	8184	103	31	9846	<i>1.08</i>	178	0.98	4994	<i>1.05</i>	8515	1.04	135	<i>1.32</i>	27	<b>0.88</b>	1840	$\checkmark$
opm2-z7-s2	3332	406	3614	7487	383	< 1	2437	<b>0.73</b>	348	<b>0.86</b>	4288	<i>1.19</i>	8071	<i>1.08</i>	318	<b>0.83</b>	< 1	<i>1.11</i>	215	$\checkmark$
pg5_34	145643	1556	257	753	997	< 1	190791	<i>1.31</i>	2926	<i>1.88</i>	399	<i>1.55</i>	492	<b>0.65</b>	1295	<i>1.30</i>	< 1	1.00	111	$\checkmark$
pigeon-10	15282073	5847	178	58632	825	< 1	8278432	<b>0.54</b>	4000	<b>0.68</b>	25	<b>0.14</b>	40022	<b>0.68</b>	< 1	<b>0.00</b>	< 1	1.00	2126	$\checkmark$
pw-myciel4	637908	6456	1814	231779	51	1	412894	<b>0.65</b>	3847	<b>0.60</b>	1393	<b>0.77</b>	91348	<b>0.39</b>	52	1.01	1	<b>0.93</b>	9471	$\checkmark$
qiu	10040	71	2198	4905	45	< 1	11018	<i>1.10</i>	76	<i>1.07</i>	1898	<b>0.86</b>	5203	<i>1.06</i>	25	<b>0.56</b>	< 1	<i>1.08</i>	23	$\checkmark$
rail507	875	237	599	1085	148	3	936	<i>1.07</i>	247	1.04	604	1.01	1095	1.01	165	<i>1.11</i>	3	0.98	1	
ran16x16	11379	85	145	422	59	< 1	14450	<i>1.27</i>	88	1.03	119	<b>0.82</b>	396	<b>0.94</b>	51	<b>0.87</b>	< 1	<b>0.86</b>	22	
reblock67	55518	239	1449	1897	143	< 1	54433	0.98	323	<i>1.35</i>	1303	<b>0.90</b>	1738	<b>0.92</b>	153	<i>1.07</i>	< 1	1.00	3575	
rmatr100-p10	800	186	823	2340	93	< 1	807	1.01	187	1.01	837	1.02	2362	1.01	98	<i>1.05</i>	< 1	0.99	40	
rmatr100-p5	398	286	716	4551	32	< 1	403	1.01	291	1.01	712	0.99	4603	1.01	32	0.99	< 1	<b>0.92</b>	69	
rmine6	88906	944	910	1104	649	< 1	103842	<i>1.17</i>	1078	<i>1.14</i>	808	<b>0.89</b>	1022	<b>0.93</b>	702	<i>1.08</i>	< 1	1.00	261	
rocII-4-11	7514	2022	57922	91613	1795	141	10725	<i>1.43</i>	2112	1.04	50871	<b>0.88</b>	85683	<b>0.94</b>	1795	1.00	103	<b>0.73</b>	858	$\checkmark$
rococoC10-001000	64603	1178	1242	6020	696	< 1	73925	<i>1.14</i>	1437	<i>1.22</i>	1504	<i>1.21</i>	6694	<i>1.11</i>	723	1.04	< 1	0.97	670	$\checkmark$
roll3000	3357	69	597	703	59	4	3311	0.99	64	<b>0.94</b>	606	1.01	709	1.01	53	<b>0.90</b>	4	<i>1.14</i>	199	
satellites1-25	1121	811	67687	76836	699	56	161	<b>0.14</b>	702	<b>0.87</b>	33850	<b>0.50</b>	60370	<b>0.79</b>	530	<b>0.76</b>	56	1.00	529	$\checkmark$
sp98ic	47572	7200	22132	30460	6050	1	55434	<i>1.17</i>	7200	1.00	19883	<b>0.90</b>	28943	<b>0.95</b>	4513	<b>0.75</b>	1	1.00	6444	$\checkmark$
sp98ir	4915	80	271	345	56	1	6741	<i>1.37</i>	101	<i>1.27</i>	295	<i>1.09</i>	385	<i>1.12</i>	68	<i>1.21</i>	1	0.96	308	
tanglegram1	53	433	1378	26392	338	< 1	47	<b>0.90</b>	397	<b>0.92</b>	1148	<b>0.83</b>	24341	<b>0.92</b>	301	<b>0.89</b>	< 1	<i>1.05</i>	< 1	
tanglegram2	3	4	23	418	4	< 1	3	1.00	4	1.00	23	1.00	419	1.00	4	1.00	< 1	<b>0.78</b>	84	
timtab1	58161	82	677	1478	57	3	51476	<b>0.89</b>	70	<b>0.86</b>	456	<b>0.67</b>	1242	<b>0.84</b>	47	<b>0.82</b>	2	<b>0.72</b>	248	$\checkmark$
triptim1	180	1655	38918	38914	931	367	33	<b>0.18</b>	820	<b>0.50</b>	42019	<i>1.08</i>	42008	<i>1.08</i>	689	<b>0.74</b>	389	<i>1.06</i>	73	
unitcal_7	274	399	12613	12627	345	126	46	<b>0.17</b>	295	<b>0.74</b>	10562	<b>0.84</b>	10577	<b>0.84</b>	291	<b>0.84</b>	105	<b>0.83</b>	9144	$\checkmark$
vpphard	10716	7200	474562	719616	4700	581	5296	<b>0.49</b>	7200	1.00	556158	<i>1.17</i>	720001	1.00	4617	0.98	624	<i>1.07</i>	1109	
zib54-UUE	59368	1798	2188	19591	169	< 1	55417	<b>0.93</b>	1791	1.00	2445	<i>1.12</i>	17378	<b>0.89</b>	160	<b>0.95</b>	< 1	<b>0.92</b>	237	$\checkmark$
geom.	5839.92	481.29	–	9009.52	244.59	1.49	5044.32	0.86	467.26	0.97	–	–	8470.17	0.94	196.38	0.80	1.36	0.92	–	

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**Table 4:** Detailed computational results on MIPLIB2010 benchmark set. The table shows the absolute and relative numbers of nodes ( $\mathbf{N}$ ,  $\mathbf{N}_Q$ ), solving time ( $\mathbf{T}$ ,  $\mathbf{T}_Q$ ), primal integral ( $\mathbf{PI}$ ,  $\mathbf{PI}_Q$ ), primal-dual integral ( $\mathbf{PDI}$ ,  $\mathbf{PDI}_Q$ ), time to best ( $\mathbf{TtB}$ ,  $\mathbf{TtB}_Q$ ) and first solution ( $\mathbf{TtF}$ ,  $\mathbf{TtF}_Q$ ), and number of conflicts found by conflict diving ( $\mathbf{C}$ ). The right-most column ( $\mathbf{I}$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving											$\mathbf{C}$	$\mathbf{I}$		
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$			$\mathbf{TtF}_Q$	
shgeom.	8276.15	496.35	2884.47	9258.53	260.33	7.23	8082.45	0.98	482.02	0.97	2623.77	0.91	8747.80	0.94	225.28	0.87	6.84	0.95	270.43		

**Table 5:** Detailed computational results on MIPLIB2010 test set. The table shows the absolute and relative numbers of nodes ( $\mathbf{N}$ ,  $\mathbf{N}_Q$ ), solving time ( $\mathbf{T}$ ,  $\mathbf{T}_Q$ ), primal integral ( $\mathbf{PI}$ ,  $\mathbf{PI}_Q$ ), primal-dual integral ( $\mathbf{PDI}$ ,  $\mathbf{PDI}_Q$ ), time to best ( $\mathbf{TtB}$ ,  $\mathbf{TtB}_Q$ ) and first solution ( $\mathbf{TtF}$ ,  $\mathbf{TtF}_Q$ ), and number of conflicts found by conflict diving ( $\mathbf{C}$ ). The right-most column ( $\mathbf{I}$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving														C	I
	N	T	PI	PDI	TtB	TtF	N	$\mathbf{N}_Q$	T	$\mathbf{T}_Q$	PI	$\mathbf{PI}_Q$	PDI	$\mathbf{PDI}_Q$	TtB	$\mathbf{TtB}_Q$	TtF	$\mathbf{TtF}_Q$				
30n20b8	1133	443	19130	30492	400	103	1721	<i>1.52</i>	359	<b>0.81</b>	16077	<b>0.84</b>	25307	<b>0.83</b>	315	<b>0.79</b>	83	<b>0.80</b>	106	$\checkmark$		
50v-10	698652	7200	3020	3515	3204	< 1	676713	0.97	7200	1.00	2559	<b>0.85</b>	2815	<b>0.80</b>	3744	<i>1.17</i>	< 1	<i>1.17</i>	283			
alc1s1	192312	7200	4920	32659	4101	< 1	172966	<b>0.90</b>	7200	1.00	4726	0.96	32875	1.01	3893	<b>0.95</b>	< 1	0.97	187	$\checkmark$		
acc-tight4	657	333	33311	33289	333	333	464	<b>0.71</b>	307	<b>0.92</b>	30755	<b>0.92</b>	30739	<b>0.92</b>	307	<b>0.92</b>	307	<b>0.92</b>	588	$\checkmark$		
acc-tight5	421	94	9448	9449	94	85	356	<b>0.84</b>	90	<b>0.95</b>	8967	<b>0.95</b>	8981	<b>0.95</b>	90	<b>0.95</b>	90	<i>1.05</i>	144			
acc-tight6	447	89	8937	8930	89	89	182	<b>0.41</b>	59	<b>0.66</b>	5884	<b>0.66</b>	5878	<b>0.66</b>	59	<b>0.66</b>	59	<b>0.66</b>	113			
aflow40b	18333	712	3835	5934	462	< 1	23098	<i>1.26</i>	659	<b>0.93</b>	3008	<b>0.78</b>	4928	<b>0.83</b>	442	0.96	< 1	1.04	457	$\checkmark$		
air04	112	47	753	782	45	7	84	<b>0.75</b>	49	1.03	766	1.02	795	1.02	47	1.03	7	1.01	33			
app1-2	79	764	32647	50714	666	157	34	<b>0.43</b>	707	<b>0.93</b>	31071	<b>0.95</b>	47359	<b>0.93</b>	526	<b>0.79</b>	151	0.97	99			
ash608gpia-3col	14	40	3951	720000	7200	7200	1	<b>0.07</b>	30	<b>0.76</b>	3003	<b>0.76</b>	720000	1.00	7200	1.00	7200	1.00	37			
atlanta-ip	12096	7200	63299	96097	5121	388	13128	<i>1.09</i>	7200	1.00	48837	<b>0.77</b>	76526	<b>0.80</b>	3853	<b>0.75</b>	239	<b>0.62</b>	1099			
atm20-100	142947	7200	720001	720001	7200	7200	155103	<i>1.09</i>	7200	1.00	720000	1.00	720000	1.00	7200	1.00	7200	1.00	154			
b2c1s1	26212	7200	73318	177576	5834	< 1	22778	<b>0.87</b>	7200	1.00	62174	<b>0.85</b>	165229	<b>0.93</b>	6818	<i>1.17</i>	< 1	1.04	332			
bab1	165129	7200	11292	31975	5156	89	196638	<i>1.19</i>	7200	1.00	9081	<b>0.80</b>	27515	<b>0.86</b>	4984	0.97	70	<b>0.79</b>	1403			
bab3	31	7200	720003	720003	7200	7200	30	0.97	7200	1.00	720003	1.00	720003	1.00	7200	1.00	7200	1.00	223			
bab5	65097	7200	16291	22852	4101	148	76156	<i>1.17</i>	7200	1.00	15750	0.97	21884	0.96	5277	<i>1.29</i>	145	0.98	1545			
beasleyC3	524	59	411	493	58	< 1	515	0.98	56	0.96	400	0.97	487	0.99	54	<b>0.93</b>	< 1	<i>1.20</i>	300			
berlin_5_8_0	1229934	7200	261	5890	87	< 1	1226329	1.00	7200	1.00	223	<b>0.85</b>	22489	<i>3.82</i>	75	<b>0.87</b>	< 1	<i>1.05</i>	89460	$\checkmark$		
bg512142	825872	7200	39718	32413	5939	< 1	884617	<i>1.07</i>	7200	1.00	46481	<i>1.17</i>	45164	<i>1.39</i>	5335	<b>0.90</b>	< 1	<b>0.88</b>	2625	$\checkmark$		
biella1	7962	1262	4391	4502	1234	1	6312	<b>0.79</b>	1166	<b>0.92</b>	4290	0.98	4398	0.98	1130	<b>0.92</b>	1	1.04	765			
bienst2	69421	637	1005	10700	259	< 1	59356	<b>0.86</b>	511	<b>0.80</b>	453	<b>0.45</b>	9178	<b>0.86</b>	157	<b>0.61</b>	< 1	<i>1.29</i>	257	$\checkmark$		
binkar10_1	2505	32	39	48	17	< 1	3200	<i>1.28</i>	42	<i>1.31</i>	29	<b>0.74</b>	42	<b>0.88</b>	16	<b>0.93</b>	< 1	<b>0.80</b>	3012	$\checkmark$		
bley_x11	17	206	18289	18358	206	175	1	<b>0.07</b>	206	1.00	18743	1.02	18792	1.02	206	1.00	181	1.04	40	$\checkmark$		
blp-ar98	215993	7200	720001	18573	5497	87	218336	1.01	7200	1.00	720000	1.00	18015	0.97	6291	<i>1.14</i>	82	<b>0.94</b>	7370	$\checkmark$		
blp-ic97	355766	7200	10248	18603	5897	2	348635	0.98	7200	1.00	11205	<i>1.09</i>	19821	<i>1.07</i>	5778	0.98	2	<i>1.05</i>	2388	$\checkmark$		
bnatt350	7359	852	85217	85212	852	852	5971	<b>0.81</b>	708	<b>0.83</b>	70850	<b>0.83</b>	70823	<b>0.83</b>	708	<b>0.83</b>	708	<b>0.83</b>	1564			
bnatt400	6506	1223	93833	122254	938	938	6941	<i>1.07</i>	1171	0.96	94633	1.01	117052	0.96	946	1.01	946	1.01	2060			
buildingenergy	73	7200	41216	76362	2204	5	73	1.01	7200	1.00	41036	1.00	75792	0.99	2199	1.00	5	1.01	470			
circ10-3	1049	7200	720000	720000	7200	7200	948	<b>0.90</b>	7200	1.00	720000	1.00	720000	1.00	7200	1.00	7200	1.00	640			

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**Table 5:** Detailed computational results on MIPLIB2010 test set. The table shows the absolute and relative numbers of nodes ( $\mathbf{N}$ ,  $\mathbf{N}_Q$ ), solving time ( $\mathbf{T}$ ,  $\mathbf{T}_Q$ ), primal integral ( $\mathbf{PI}$ ,  $\mathbf{PI}_Q$ ), primal-dual integral ( $\mathbf{PDI}$ ,  $\mathbf{PDI}_Q$ ), time to best ( $\mathbf{TtB}$ ,  $\mathbf{TtB}_Q$ ) and first solution ( $\mathbf{TtF}$ ,  $\mathbf{TtF}_Q$ ), and number of conflicts found by conflict diving ( $\mathbf{C}$ ). The right-most column ( $\mathbf{I}$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving														C	I
	N	T	PI	PDI	TtB	TtF	N	$N_Q$	T	$T_Q$	PI	$PI_Q$	PDI	$PDI_Q$	TtB	$TtB_Q$	TtF	$TtF_Q$				
co-100	23763	7200	89325	321766	6399	16	46979	<i>1.98</i>	7200	1.00	70275	<b>0.79</b>	180388	<b>0.56</b>	5527	<b>0.86</b>	18	<i>1.06</i>	19865	$\checkmark$		
core2536-691	319	361	656	1119	361	1	354	<i>1.11</i>	370	1.03	696	<i>1.06</i>	1160	1.04	370	1.03	1	1.01	0			
core4872-1529	829	7200	27315	38659	5553	42	791	<b>0.95</b>	7200	1.00	28769	<i>1.05</i>	40067	1.04	5551	1.00	42	1.01	45			
cov1075	2229092	5233	155	42458	104	< 1	2134407	0.96	4881	<b>0.93</b>	110	<b>0.71</b>	39423	<b>0.93</b>	68	<b>0.65</b>	< 1	1.00	1203			
csched007	323204	4706	470592	36170	1839	82	221186	<b>0.68</b>	3390	<b>0.72</b>	339041	<b>0.72</b>	24865	<b>0.69</b>	1305	<b>0.71</b>	60	<b>0.73</b>	830			
csched008	246241	2749	274937	13039	2137	84	226694	<b>0.92</b>	2364	<b>0.86</b>	236449	<b>0.86</b>	7157	<b>0.55</b>	1653	<b>0.77</b>	30	<b>0.35</b>	9434			
csched010	211937	3923	8121	26258	844	50	225756	<i>1.07</i>	4284	<i>1.09</i>	8189	1.01	29820	<i>1.14</i>	943	<i>1.12</i>	45	<b>0.90</b>	922			
d10200	760704	7200	1325	1501	3991	< 1	835075	<i>1.10</i>	7200	1.00	1268	0.96	1444	0.96	4601	<i>1.15</i>	< 1	1.03	4810			
d20200	98799	7200	2910	7109	773	1	105436	<i>1.07</i>	7200	1.00	3498	<i>1.20</i>	7696	<i>1.08</i>	602	<b>0.78</b>	1	1.01	1461			
dano3mip	1190	7200	63114	169654	3839	1	1204	1.01	7200	1.00	65017	<i>1.03</i>	171273	1.01	2985	<b>0.78</b>	1	1.00	28			
danoint	1177174	4398	986	12905	226	7	1155238	0.98	4281	0.97	1432	<i>1.45</i>	13887	<i>1.08</i>	834	<i>3.69</i>	7	<b>0.93</b>	1012			
datt256	1	7200	720035	720035	7200	7200	1	1.00	7200	1.00	720058	1.00	720058	1.00	7200	1.00	7200	1.00	0			
dc1c	9517	7200	28198	31056	5630	7	7243	<b>0.76</b>	7200	1.00	30260	<i>1.07</i>	33082	<i>1.07</i>	4350	<b>0.77</b>	7	1.00	2479			
dc1l	1328	7200	50840	59971	5470	1	1268	<b>0.95</b>	7200	1.00	56238	<i>1.11</i>	65279	<i>1.09</i>	4022	<b>0.74</b>	1	1.01	1080			
dfn-gwin-UUM	21127	107	466	960	25	< 1	27429	<i>1.30</i>	125	<i>1.16</i>	317	<b>0.68</b>	878	<b>0.91</b>	28	<i>1.13</i>	< 1	<i>1.07</i>	2338	$\checkmark$		
dg012142	331307	7200	207925	462952	5262	< 1	347504	<i>1.05</i>	7200	1.00	182325	<b>0.88</b>	446877	0.97	5135	0.98	< 1	0.96	1454			
dolom1	1557	7200	593047	648750	3220	1	1412	<b>0.91</b>	7200	1.00	621258	<i>1.05</i>	664584	1.02	2483	<b>0.77</b>	1	0.99	1964			
ds-big	2	7200	606433	713475	1801	26	2	<b>0.92</b>	7200	1.00	606532	1.00	714618	1.00	1824	1.01	25	0.96	0			
eil33-2	718	84	585	1415	75	< 1	718	1.00	84	1.00	584	1.00	1415	1.00	75	1.00	< 1	0.97	0			
eilA101-2	5915	7200	132060	186031	6134	7	5217	<b>0.88</b>	7200	1.00	136117	1.03	190941	1.03	4253	<b>0.69</b>	8	<i>1.24</i>	2			
eilB101	32681	509	1838	4968	408	< 1	22455	<b>0.69</b>	385	<b>0.76</b>	1241	<b>0.68</b>	3690	<b>0.74</b>	278	<b>0.68</b>	< 1	1.02	9			
enlight13	1	1	0	2	< 1	< 1	1	1.00	1	1.00	0	<b>0.00</b>	1	<b>0.64</b>	< 1	<b>0.73</b>	< 1	<b>0.73</b>	0			
enlight14	1	1	2	720000	7200	7200	1	1.00	1	1.00	2	<b>0.83</b>	720000	1.00	7200	1.00	7200	1.00	0			
enlight15	1	1	0	2	< 1	< 1	1	1.00	1	1.00	0	<b>0.00</b>	2	<b>0.91</b>	< 1	<b>0.91</b>	< 1	<b>0.91</b>	0			
enlight16	1	1	2	720000	7200	7200	1	1.00	1	1.00	2	1.00	720000	1.00	7200	1.00	7200	1.00	0			
enlight9	1	1	< 1	720000	7200	7200	1	1.00	1	1.00	1	<i>1.50</i>	720000	1.00	7200	1.00	7200	1.00	0			
ex10	1	625	62551	62542	625	625	1	1.00	581	<b>0.93</b>	58073	<b>0.93</b>	58064	<b>0.93</b>	581	<b>0.93</b>	581	<b>0.93</b>	0			
ex1010-pi	3061	7200	30447	79628	1760	< 1	4112	<i>1.34</i>	7200	1.00	28283	<b>0.93</b>	77476	0.97	3042	<i>1.73</i>	< 1	1.04	106			
ex9	1	35	3457	3457	35	35	1	1.00	35	1.00	3475	1.01	3474	1.00	35	1.00	35	1.00	0			
f2000	550	7200	720001	720001	7200	7200	477	<b>0.87</b>	7200	1.00	720039	1.00	720039	1.00	7200	1.00	7200	1.00	335			

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Instance	default						confdiving													
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$	$\mathbf{C}$	$\mathbf{I}$
g200x740i	164274	7200	56002	98860	4756	< 1	220387	<i>1.34</i>	7200	1.00	38173	<b>0.68</b>	81550	<b>0.82</b>	5344	<i>1.12</i>	< 1	<b>0.72</b>	4650	
germanrr	2329	7200	50605	58179	3747	435	2882	<i>1.24</i>	7200	1.00	54978	<i>1.09</i>	62585	<i>1.08</i>	3746	1.00	474	<i>1.09</i>	299	
germany50-DBM	36430	7200	11470	32964	3766	1	33063	<b>0.91</b>	7200	1.00	12100	<i>1.05</i>	33704	1.02	4531	<i>1.20</i>	1	1.03	2293	
glass4	1400467	4558	109756	129350	4427	< 1	1319902	<b>0.94</b>	4971	<i>1.09</i>	116911	<i>1.07</i>	138200	<i>1.07</i>	4847	<i>1.09</i>	< 1	<i>1.06</i>	22999	$\checkmark$
gmu-35-40	2194641	7200	200	249	2266	< 1	2845684	<i>1.30</i>	7200	1.00	190	<b>0.95</b>	247	0.99	2792	<i>1.23</i>	< 1	1.00	2193	
gmu-35-50	1002146	7200	720017	445	2561	< 1	1078543	<i>1.08</i>	7200	1.00	720004	1.00	479	<i>1.08</i>	3510	<i>1.37</i>	< 1	1.00	2330	$\checkmark$
gmut-75-50	128810	7200	4341	4893	1397	< 1	126774	0.98	7200	1.00	4927	<i>1.13</i>	5509	<i>1.13</i>	1772	<i>1.27</i>	< 1	<b>0.95</b>	21	
gmut-77-40	231220	7200	3114	3311	968	< 1	217323	<b>0.94</b>	7200	1.00	2916	<b>0.94</b>	3114	<b>0.94</b>	2094	<i>2.16</i>	< 1	1.00	57	
go19	1113664	7200	674	39570	327	< 1	886386	<b>0.80</b>	7200	1.00	572	<b>0.85</b>	39705	1.00	211	<b>0.64</b>	< 1	1.00	1247	
hanoi5	31054	7200	720001	720001	7200	7200	32392	1.04	7200	1.00	720001	1.00	720001	1.00	7200	1.00	7200	1.00	4652	
ic97_potential	4257119	7200	549	8861	1657	< 1	5392772	<i>1.27</i>	7200	1.00	454	<b>0.83</b>	5953	<b>0.67</b>	2716	<i>1.64</i>	< 1	<b>0.70</b>	16912	$\checkmark$
iis-100-0-cov	100588	717	199	11399	19	< 1	99583	0.99	765	<i>1.07</i>	217	<i>1.09</i>	12224	<i>1.07</i>	19	1.02	< 1	1.00	794	
iis-bupa-cov	175247	2496	503	24896	82	< 1	178672	1.02	2528	1.01	543	<i>1.08</i>	25265	1.01	97	<i>1.18</i>	< 1	1.00	288	
iis-pima-cov	8692	418	644	4809	132	< 1	7914	<b>0.91</b>	402	0.96	578	<b>0.90</b>	4674	0.97	110	<b>0.83</b>	< 1	<i>1.14</i>	13	
in	1	7200	568412	712139	78	77	1	1.00	7200	1.00	568247	1.00	712129	1.00	70	<b>0.90</b>	69	<b>0.90</b>	0	
ivu06-big	1	7200	29189	720054	278	246	1	1.00	7200	1.00	29782	1.02	720053	1.00	284	1.02	251	1.02	0	
ivu52	1	7200	572205	720000	346	22	1	1.00	7200	1.00	575845	1.01	720001	1.00	539	<i>1.56</i>	38	<i>1.71</i>	0	
janos-us-DDM	1813133	7200	254	356	5582	< 1	1778148	0.98	6706	<b>0.93</b>	254	1.00	168	<b>0.47</b>	4955	<b>0.89</b>	< 1	0.97	10594	$\checkmark$
kl6x240	751754	1352	135155	5674	178	< 1	675120	<b>0.90</b>	1396	1.03	139570	1.03	6049	<i>1.07</i>	151	<b>0.85</b>	< 1	1.00	310	
lectsched-1	17397	218	21800	21799	218	218	1789	<b>0.10</b>	146	<b>0.67</b>	14568	<b>0.67</b>	14564	<b>0.67</b>	146	<b>0.67</b>	146	<b>0.67</b>	89	
lectsched-1-obj	102069	7200	301234	493507	3592	1747	195283	<i>1.91</i>	7200	1.00	247325	<b>0.82</b>	480373	0.97	4574	<i>1.27</i>	1502	<b>0.86</b>	6650	$\checkmark$
lectsched-2	224	37	3652	3650	36	36	307	<i>1.37</i>	44	<i>1.19</i>	4354	<i>1.19</i>	4353	<i>1.19</i>	44	<i>1.19</i>	44	<i>1.19</i>	30	
lectsched-3	1117	150	15038	15023	150	150	16420	<i>14.70</i>	208	<i>1.38</i>	20805	<i>1.38</i>	20803	<i>1.38</i>	208	<i>1.38</i>	208	<i>1.38</i>	64	$\checkmark$
lectsched-4-obj	777	24	1960	1963	24	8	625	<b>0.80</b>	18	<b>0.72</b>	1316	<b>0.67</b>	1315	<b>0.67</b>	18	<b>0.72</b>	3	<b>0.40</b>	61	$\checkmark$
leo1	81384	7200	28527	53482	4138	< 1	66433	<b>0.82</b>	7200	1.00	23591	<b>0.83</b>	49235	<b>0.92</b>	5153	<i>1.25</i>	< 1	0.97	103	
leo2	93537	7200	79009	720000	3276	1	92595	0.99	7200	1.00	77495	0.98	720001	1.00	4430	<i>1.35</i>	1	0.97	1820	
liu	999658	7200	58684	392849	5588	< 1	801000	<b>0.80</b>	7200	1.00	53488	<b>0.91</b>	390277	0.99	4246	<b>0.76</b>	< 1	<i>1.35</i>	1069	$\checkmark$
lotsize	13137	7200	52283	58956	5395	298	17906	<i>1.36</i>	7200	1.00	63792	<i>1.22</i>	69505	<i>1.18</i>	6079	<i>1.13</i>	379	<i>1.27</i>	183	
lrsa120	482080	7200	720001	720001	7200	7200	490809	1.02	7200	1.00	720000	1.00	720000	1.00	7200	1.00	7200	1.00	339288	
m100n500k4r1	4915772	7200	28974	28982	36	< 1	4818432	0.98	7200	1.00	28971	1.00	28979	1.00	35	0.98	< 1	1.00	23	

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Instance	default						confdiving													
	N	T	PI	PDI	TtB	TtF	N	$\mathbf{N}_Q$	T	$\mathbf{T}_Q$	PI	$\mathbf{PI}_Q$	PDI	$\mathbf{PDI}_Q$	TtB	$\mathbf{TtB}_Q$	TtF	$\mathbf{TtF}_Q$	C	I
macrophage	558206	6631	2168	49564	2150	< 1	382837	<b>0.69</b>	6367	0.96	1640	<b>0.76</b>	45134	<b>0.91</b>	1328	<b>0.62</b>	< 1	1.00	910	
map06	776	944	94439	30919	500	2	771	0.99	888	<b>0.94</b>	88814	<b>0.94</b>	28399	<b>0.92</b>	551	<i>1.10</i>	2	0.99	12	
map10	1269	1006	100607	21500	843	2	1475	<i>1.16</i>	1020	1.01	101997	1.01	21129	0.98	864	1.02	2	0.98	19	
map14	851	728	72817	10253	495	2	817	0.96	764	<i>1.05</i>	76433	<i>1.05</i>	10597	1.03	545	<i>1.10</i>	2	0.99	18	
map18	262	306	1785	3522	55	2	281	<i>1.08</i>	280	<b>0.91</b>	1740	0.97	3374	0.96	75	<i>1.37</i>	2	1.00	14	
map20	258	275	1080	2390	81	2	246	<b>0.95</b>	262	<b>0.95</b>	1085	1.00	2374	0.99	55	<b>0.68</b>	2	1.01	8	
markshare_5_0	67148485	7200	302974	720000	3387	< 1	79823973	<i>1.19</i>	7200	1.00	313487	1.03	720000	1.00	3670	<i>1.08</i>	< 1	1.00	86924	
maxgasflow	888534	7200	7752	37311	4989	1	1053385	<i>1.19</i>	7200	1.00	8548	<i>1.10</i>	43704	<i>1.17</i>	5065	1.02	1	<b>0.73</b>	7552	
mc11	19621	761	76112	1497	458	< 1	19265	0.98	847	<i>1.11</i>	84712	<i>1.11</i>	1596	<i>1.07</i>	528	<i>1.15</i>	< 1	0.96	620	
mcsched	16226	356	151	2203	228	< 1	16328	1.01	286	<b>0.80</b>	140	<b>0.93</b>	1750	<b>0.79</b>	161	<b>0.70</b>	< 1	1.04	21	$\checkmark$
methanosarcina	24748	7200	22307	414913	5924	< 1	16874	<b>0.68</b>	7200	1.00	22177	0.99	422198	1.02	5542	<b>0.94</b>	< 1	<i>1.25</i>	747	
mik-250-1-100-1	28660	87	37	188	1	< 1	32272	<i>1.13</i>	96	<i>1.10</i>	34	<b>0.92</b>	202	<i>1.08</i>	1	0.99	< 1	1.00	51	
mine-166-5	2037	62	3067	3326	61	< 1	2974	<i>1.46</i>	61	0.99	3045	0.99	3311	1.00	60	0.98	< 1	<i>1.33</i>	435	
mine-90-10	38761	365	2470	2690	307	< 1	54451	<i>1.40</i>	587	<i>1.61</i>	3263	<i>1.32</i>	3567	<i>1.33</i>	496	<i>1.62</i>	< 1	1.00	2806	
mining	1	7200	720006	720006	165	134	1	1.00	7200	1.00	720006	1.00	720006	1.00	158	<b>0.95</b>	129	0.96	0	
mkc	689644	7200	2596	3781	2352	< 1	690327	1.00	7200	1.00	3250	<i>1.25</i>	4491	<i>1.19</i>	4244	<i>1.80</i>	< 1	1.00	373	
momentum1	136132	7200	53411	98553	4333	6	134785	0.99	7200	1.00	52621	0.99	92641	<b>0.94</b>	5780	<i>1.33</i>	6	0.99	1217	
momentum3	390	7200	326157	562398	5612	206	330	<b>0.84</b>	7200	1.00	336598	1.03	566593	1.01	4459	<b>0.79</b>	225	<i>1.09</i>	252	
msc98-ip	7657	7200	79841	84199	5535	216	14749	<i>1.93</i>	6536	<b>0.91</b>	93202	<i>1.17</i>	96622	<i>1.15</i>	5048	<b>0.91</b>	531	<i>2.46</i>	1082	
mspp16	54	2272	72169	81463	1444	721	85	<i>1.57</i>	2465	<i>1.09</i>	73235	1.01	83073	1.02	1730	<i>1.20</i>	731	1.01	5	
mzzv11	2138	366	11483	11647	294	< 1	3350	<i>1.57</i>	525	<i>1.44</i>	12409	<i>1.08</i>	12670	<i>1.09</i>	417	<i>1.42</i>	< 1	<b>0.94</b>	60	$\checkmark$
n15-3	9	7200	285690	407873	5412	127	1	<b>0.11</b>	7200	1.00	327723	<i>1.15</i>	433269	<i>1.06</i>	2012	<b>0.37</b>	100	<b>0.79</b>	2	$\checkmark$
n3-3	10674	7200	28482	105067	5801	1	6714	<b>0.63</b>	7200	1.00	31683	<i>1.11</i>	109017	1.04	4406	<b>0.76</b>	1	<i>1.23</i>	150	$\checkmark$
n3700	5805	7200	45622	158011	4513	< 1	3914	<b>0.67</b>	7200	1.00	44770	0.98	157253	1.00	5464	<i>1.21</i>	< 1	1.02	25	
n3705	6559	7200	49886	162010	5689	< 1	5641	<b>0.86</b>	7200	1.00	53573	<i>1.07</i>	164799	1.02	3860	<b>0.68</b>	< 1	<i>1.13</i>	19	
n370a	4691	7200	45749	154562	5935	< 1	4113	<b>0.88</b>	7200	1.00	46540	1.02	155066	1.00	5262	<b>0.89</b>	< 1	<b>0.89</b>	42	
n3div36	212580	7200	6230	31991	748	1	205746	0.97	7200	1.00	6659	<i>1.07</i>	32529	1.02	2320	<i>3.10</i>	1	1.03	593	
n3seq24	798	7200	281752	284494	5738	18	756	<b>0.95</b>	7200	1.00	292996	1.04	295759	1.04	5922	1.03	19	<i>1.08</i>	4357	
n4-3	2965	189	1008	2019	108	< 1	3401	<i>1.15</i>	205	<i>1.09</i>	1085	<i>1.08</i>	2344	<i>1.16</i>	109	1.02	< 1	0.98	1610	$\checkmark$
n9-3	21333	7200	12339	61187	4096	< 1	22017	1.03	7200	1.00	13268	<i>1.08</i>	62621	1.02	5345	<i>1.30</i>	< 1	0.97	1067	

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**Table 5:** Detailed computational results on MIPLIB2010 test set. The table shows the absolute and relative numbers of nodes ( $N$ ,  $N_Q$ ), solving time ( $T$ ,  $T_Q$ ), primal integral ( $PI$ ,  $PI_Q$ ), primal-dual integral ( $PDI$ ,  $PDI_Q$ ), time to best ( $TtB$ ,  $TtB_Q$ ) and first solution ( $TtF$ ,  $TtF_Q$ ), and number of conflicts found by conflict diving ( $C$ ). The right-most column ( $I$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving													C	I
	N	T	PI	PDI	TtB	TtF	N	$N_Q$	T	$T_Q$	PI	$PI_Q$	PDI	$PDI_Q$	TtB	$TtB_Q$	TtF	$TtF_Q$			
nag	52436	7200	237509	588866	5453	223	62161	<i>1.19</i>	7200	1.00	216375	<b>0.91</b>	584059	0.99	5417	0.99	158	<b>0.71</b>	3057	$\checkmark$	
neos-1109824	6851	101	615	1082	19	5	5825	<b>0.85</b>	79	<b>0.78</b>	333	<b>0.54</b>	668	<b>0.62</b>	13	<b>0.71</b>	2	<b>0.32</b>	252	$\checkmark$	
neos-1171692	665	576	529	538	576	< 1	203	<b>0.30</b>	138	<b>0.24</b>	387	<b>0.73</b>	398	<b>0.74</b>	138	<b>0.24</b>	< 1	<b>0.86</b>	4		
neos-1171737	4349	7200	10262	10269	1713	< 1	4005	<b>0.92</b>	7200	1.00	11432	<i>1.11</i>	11437	<i>1.11</i>	774	<b>0.45</b>	< 1	<b>0.88</b>	1		
neos-1224597	1	1	121	123	1	1	1	1.00	2	<i>1.59</i>	147	<i>1.21</i>	145	<i>1.19</i>	2	<i>1.59</i>	1	<i>1.08</i>	5		
neos-1311124	15287825	7200	20	3976	2926	< 1	15720083	1.03	7200	1.00	20	0.98	3976	1.00	406	<b>0.14</b>	< 1	1.00	1944		
neos-1337307	547670	7200	8981	9618	1068	90	562102	1.03	7200	1.00	8220	<b>0.92</b>	8704	<b>0.90</b>	222	<b>0.21</b>	82	<b>0.91</b>	2853		
neos-1396125	40507	349	3562	9858	164	29	49225	<i>1.22</i>	360	1.03	2451	<b>0.69</b>	8666	<b>0.88</b>	177	<i>1.08</i>	24	<b>0.81</b>	309	$\checkmark$	
neos-1426635	7800036	7200	16	8107	3028	< 1	8479862	<i>1.09</i>	7200	1.00	15	<b>0.95</b>	8107	1.00	1270	<b>0.42</b>	< 1	1.00	158694		
neos-1426662	1971233	7200	67	76481	2826	< 1	1772642	<b>0.90</b>	7200	1.00	68	1.00	75661	0.99	1318	<b>0.47</b>	< 1	1.00	8312		
neos-1429212	1843	7200	720001	720001	7200	7200	3235	<i>1.76</i>	7200	1.00	720000	1.00	720000	1.00	7200	1.00	7200	1.00	493		
neos-1436709	2903018	7200	19	5600	137	< 1	2877043	0.99	7200	1.00	21	<i>1.06</i>	5601	1.00	2200	<i>16.02</i>	< 1	1.00	34354		
neos-1440225	3734	82	8218	8226	82	82	4476	<i>1.20</i>	105	<i>1.27</i>	10453	<i>1.27</i>	10456	<i>1.27</i>	105	<i>1.27</i>	105	<i>1.27</i>	66		
neos-1440460	6006292	7200	21	3020	2121	< 1	5974018	0.99	7200	1.00	20	0.98	3019	1.00	737	<b>0.35</b>	< 1	1.00	26334	$\checkmark$	
neos-1442119	2189513	7200	18	3974	307	< 1	2297826	<i>1.05</i>	7200	1.00	20	<i>1.14</i>	3975	1.00	1505	<i>4.89</i>	< 1	1.00	20642		
neos-1442657	2858252	7200	21	6944	96	< 1	2700168	<b>0.94</b>	7200	1.00	21	0.98	6942	1.00	947	<i>9.91</i>	< 1	1.00	64330		
neos-1601936	10958	5705	466880	466878	4302	615	16363	<i>1.49</i>	6081	<i>1.07</i>	453103	0.97	453113	0.97	5706	<i>1.33</i>	438	<b>0.71</b>	3388		
neos-1605061	715	7200	719528	719788	7156	7156	1177	<i>1.65</i>	7200	1.00	713674	0.99	717213	1.00	6757	<b>0.94</b>	6757	<b>0.94</b>	630		
neos-1605075	3213	7200	664309	667362	5218	1122	4338	<i>1.35</i>	7200	1.00	598649	<b>0.90</b>	602697	<b>0.90</b>	6036	<i>1.16</i>	874	<b>0.78</b>	1105		
neos-1616732	2971128	5547	384	26113	452	< 1	2992570	1.01	5559	1.00	413	<i>1.08</i>	26238	1.00	507	<i>1.12</i>	< 1	1.00	203		
neos-1620770	1617989	7200	15	122579	< 1	< 1	1494478	<b>0.92</b>	7200	1.00	17	<i>1.11</i>	146959	<i>1.20</i>	< 1	1.02	< 1	1.03	335342		
neos-476283	517	177	1454	3932	148	14	671	<i>1.30</i>	181	1.02	1454	1.00	3933	1.00	164	<i>1.11</i>	14	1.01	11249	$\checkmark$	
neos-506422	4763	52	5230	5232	52	< 1	4707	0.99	51	0.98	5123	0.98	5123	0.98	51	0.98	< 1	1.00	110	$\checkmark$	
neos-506428	420	4300	269318	351030	3836	2376	452	<i>1.07</i>	4623	<i>1.08</i>	282185	<i>1.05</i>	367151	<i>1.05</i>	4416	<i>1.15</i>	2417	1.02	76		
neos-555424	465993	2660	5090	5096	2295	< 1	154690	<b>0.33</b>	1216	<b>0.46</b>	5055	0.99	5062	0.99	1216	<b>0.53</b>	< 1	0.97	2892		
neos-631710	3	7200	47192	189154	1113	82	2	<b>0.63</b>	7200	1.00	48026	1.02	191625	1.01	1229	<i>1.10</i>	84	1.03	21		
neos-686190	8949	127	1817	2923	114	4	6792	<b>0.76</b>	111	<b>0.87</b>	1579	<b>0.87</b>	2654	<b>0.91</b>	91	<b>0.79</b>	< 1	<b>0.04</b>	650		
neos-693347	50294	5034	89808	89790	4422	814	33698	<b>0.67</b>	3578	<b>0.71</b>	34642	<b>0.39</b>	34640	<b>0.39</b>	3578	<b>0.81</b>	304	<b>0.37</b>	10124		
neos-738098	775	7200	720075	720075	7200	7200	1402	<i>1.81</i>	7200	1.00	720001	1.00	720001	1.00	7200	1.00	7200	1.00	201		
neos-777800	1	4	418	421	4	4	1	1.00	5	<i>1.11</i>	467	<i>1.12</i>	468	<i>1.11</i>	5	<i>1.11</i>	5	<i>1.11</i>	1		

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**Table 5:** Detailed computational results on MIPLIB2010 test set. The table shows the absolute and relative numbers of nodes ( $\mathbf{N}$ ,  $\mathbf{N}_Q$ ), solving time ( $\mathbf{T}$ ,  $\mathbf{T}_Q$ ), primal integral ( $\mathbf{PI}$ ,  $\mathbf{PI}_Q$ ), primal-dual integral ( $\mathbf{PDI}$ ,  $\mathbf{PDI}_Q$ ), time to best ( $\mathbf{TtB}$ ,  $\mathbf{TtB}_Q$ ) and first solution ( $\mathbf{TtF}$ ,  $\mathbf{TtF}_Q$ ), and number of conflicts found by conflict diving ( $\mathbf{C}$ ). The right-most column ( $\mathbf{I}$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving													
	N	T	PI	PDI	TtB	TtF	N	$\mathbf{N}_Q$	T	$\mathbf{T}_Q$	PI	$\mathbf{PI}_Q$	PDI	$\mathbf{PDI}_Q$	TtB	$\mathbf{TtB}_Q$	TtF	$\mathbf{TtF}_Q$	C	I
neos-785912	304	64	6394	720000	7200	7200	206	<b>0.68</b>	49	<b>0.76</b>	4889	<b>0.76</b>	720000	1.00	7200	1.00	7200	1.00	89	
neos-807456	88293	7200	720001	720001	7200	7200	79010	<b>0.89</b>	7200	1.00	720000	1.00	720000	1.00	7200	1.00	7200	1.00	226	
neos-820146	1955429	7200	720000	720000	7200	7200	1985580	1.02	7200	1.00	720000	1.00	720000	1.00	7200	1.00	7200	1.00	54916	
neos-820157	1343991	7200	720002	720002	7200	7200	1502156	<i>1.12</i>	7200	1.00	720001	1.00	720001	1.00	7200	1.00	7200	1.00	46349	
neos-824661	81	1720	26267	26660	1720	2	26	<b>0.32</b>	947	<b>0.55</b>	19671	<b>0.75</b>	20061	<b>0.75</b>	947	<b>0.55</b>	2	0.98	69	$\checkmark$
neos-824695	53	461	6529	6660	461	1	51	<b>0.95</b>	462	1.00	5858	<b>0.90</b>	5990	<b>0.90</b>	462	1.00	1	0.99	47	$\checkmark$
neos-826650	29781	7200	413829	424387	4547	4036	38867	<i>1.31</i>	7200	1.00	219879	<b>0.53</b>	237116	<b>0.56</b>	3425	<b>0.75</b>	2024	<b>0.50</b>	3212	
neos-826694	65	460	3088	3226	460	1	76	<i>1.17</i>	487	<i>1.06</i>	4247	<i>1.38</i>	4384	<i>1.36</i>	487	<i>1.06</i>	1	0.97	40	
neos-826812	5	127	1767	1979	127	< 1	4	<b>0.87</b>	102	<b>0.80</b>	1582	<b>0.90</b>	1793	<b>0.91</b>	102	<b>0.80</b>	< 1	1.01	63	
neos-826841	205677	7200	2636	27365	2430	19	209253	1.02	7200	1.00	5005	<i>1.90</i>	29655	<i>1.08</i>	1542	<b>0.63</b>	47	<i>2.51</i>	12812	
neos-847302	258494	7200	2257	717454	2379	4	264049	1.02	7200	1.00	4044	<i>1.79</i>	718277	1.00	1703	<b>0.72</b>	5	1.02	18970	
neos-849702	19129	457	45692	45680	457	457	24138	<i>1.26</i>	554	<i>1.21</i>	55383	<i>1.21</i>	55392	<i>1.21</i>	554	<i>1.21</i>	554	<i>1.21</i>	453	
neos-859770	1	176	17636	720000	7200	7200	1	1.00	175	0.99	17505	0.99	720000	1.00	7200	1.00	7200	1.00	6	
neos-885086	371	6549	12278	12361	2980	< 1	359	0.97	6557	1.00	12036	0.98	12113	0.98	2738	<b>0.92</b>	< 1	<i>1.06</i>	0	
neos-885524	1112	121	752	754	121	7	3580	<i>3.22</i>	925	<i>7.64</i>	2944	<i>3.91</i>	2944	<i>3.90</i>	925	<i>7.64</i>	29	<i>3.86</i>	197	$\checkmark$
neos-911880	751773	7200	2234	11810	1068	< 1	1163271	<i>1.55</i>	7200	1.00	2036	<b>0.91</b>	11867	1.00	1033	0.97	< 1	<b>0.92</b>	1287	$\checkmark$
neos-916792	119285	971	2478	7968	290	13	147959	<i>1.24</i>	1193	<i>1.23</i>	2588	1.04	10161	<i>1.28</i>	392	<i>1.35</i>	13	0.98	99	
neos-932816	578	7200	155970	421024	5846	< 1	543	<b>0.94</b>	7200	1.00	143847	<b>0.92</b>	420054	1.00	6360	<i>1.09</i>	< 1	1.03	67	
neos-933638	327	3609	88808	88810	3566	< 1	417	<i>1.28</i>	3569	0.99	148946	<i>1.68</i>	148968	<i>1.68</i>	3072	<b>0.86</b>	< 1	<i>1.17</i>	56	
neos-933966	649	2723	136937	136946	2723	< 1	447	<b>0.69</b>	1553	<b>0.57</b>	66945	<b>0.49</b>	66931	<b>0.49</b>	1553	<b>0.57</b>	< 1	0.98	67	
neos-934278	1254	7200	348201	348917	4801	< 1	661	<b>0.53</b>	7200	1.00	405372	<i>1.16</i>	405996	<i>1.16</i>	2940	<b>0.61</b>	< 1	<b>0.89</b>	141	
neos-935627	1245	7121	76421	79168	5837	1	831	<b>0.67</b>	7200	1.01	61843	<b>0.81</b>	64761	<b>0.82</b>	6277	<i>1.08</i>	1	<i>1.09</i>	46	
neos-935769	965	3723	35913	38726	3707	1	1487	<i>1.54</i>	5857	<i>1.57</i>	34843	0.97	37130	0.96	4782	<i>1.29</i>	1	1.02	96	
neos-937511	442	5517	35226	36533	2510	1	691	<i>1.56</i>	5645	1.02	54094	<i>1.54</i>	55460	<i>1.52</i>	3689	<i>1.47</i>	1	<i>1.08</i>	32	$\checkmark$
neos-937815	1040	7200	75221	78283	4920	1	2205	<i>2.12</i>	7200	1.00	85926	<i>1.14</i>	88746	<i>1.13</i>	4528	<b>0.92</b>	1	<b>0.81</b>	86	$\checkmark$
neos-941262	1704	7200	87642	88289	3427	1	2150	<i>1.26</i>	7200	1.00	109596	<i>1.25</i>	110234	<i>1.25</i>	4471	<i>1.30</i>	1	1.00	94	$\checkmark$
neos-941313	52	2303	18320	18320	1865	152	24	<b>0.46</b>	1418	<b>0.62</b>	17221	<b>0.94</b>	17216	<b>0.94</b>	1418	<b>0.76</b>	152	1.00	1028	
neos-942830	658868	7200	1115	7834	30	4	416475	<b>0.63</b>	1272	<b>0.66</b>	1150	1.03	5906	<b>0.75</b>	41	<i>1.38</i>	5	<i>1.23</i>	1886	
neos-948126	1733	1928	152485	154718	6094	1	1601	<b>0.92</b>	7200	1.00	181224	<i>1.19</i>	183454	<i>1.19</i>	5578	<b>0.92</b>	1	1.03	32	$\checkmark$
neos-952987	14	7200	720002	720002	7200	7200	16	<i>1.21</i>	7200	1.00	720002	1.00	720002	1.00	7200	1.00	7200	1.00	40	

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**Table 5:** Detailed computational results on MIPLIB2010 test set. The table shows the absolute and relative numbers of nodes ( $\mathbf{N}$ ,  $\mathbf{N}_Q$ ), solving time ( $\mathbf{T}$ ,  $\mathbf{T}_Q$ ), primal integral ( $\mathbf{PI}$ ,  $\mathbf{PI}_Q$ ), primal-dual integral ( $\mathbf{PDI}$ ,  $\mathbf{PDI}_Q$ ), time to best ( $\mathbf{TtB}$ ,  $\mathbf{TtB}_Q$ ) and first solution ( $\mathbf{TtF}$ ,  $\mathbf{TtF}_Q$ ), and number of conflicts found by conflict diving ( $\mathbf{C}$ ). The right-most column ( $\mathbf{I}$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving													
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$	$\mathbf{C}$	$\mathbf{I}$
neos-957389	1	16	1615	1625	16	16	1	1.00	16	1.00	1615	1.00	1620	1.00	16	1.00	16	1.00		0
neos-984165	1456	7200	127659	132256	4399	1	1295	<b>0.89</b>	7200	1.00	178821	<i>1.40</i>	183123	<i>1.38</i>	5786	<i>1.32</i>	1	1.00	55	$\checkmark$
neos13	18492	339	3134	7756	280	1	54026	<i>2.92</i>	826	<i>2.44</i>	3194	1.02	16541	<i>2.13</i>	701	<i>2.50</i>	1	1.00	178	$\checkmark$
neos15	329950	1383	539	3942	211	< 1	773215	<i>2.34</i>	3167	<i>2.29</i>	516	0.96	8865	<i>2.25</i>	324	<i>1.54</i>	< 1	<i>1.33</i>	3488	$\checkmark$
neos16	5685565	7200	2462	9628	87	24	6114146	<i>1.08</i>	7200	1.00	3141	<i>1.28</i>	17721	<i>1.84</i>	213	<i>2.44</i>	31	<i>1.26</i>	223938	
neos18	1338	29	120	485	9	< 1	1090	<b>0.81</b>	24	<b>0.82</b>	124	1.04	429	<b>0.88</b>	11	<i>1.18</i>	< 1	<i>1.16</i>	253	$\checkmark$
neos6	7533	538	5618	5618	538	35	3296	<b>0.44</b>	327	<b>0.61</b>	5416	0.96	5414	0.96	327	<b>0.61</b>	17	<b>0.48</b>	1188	
neos788725	101543	310	30972	720000	7200	7200	120986	<i>1.19</i>	348	<i>1.12</i>	34810	<i>1.12</i>	720000	1.00	7200	1.00	7200	1.00	790	
neos808444	386	1421	142050	142051	1421	1421	628	<i>1.62</i>	1944	<i>1.37</i>	194409	<i>1.37</i>	194414	<i>1.37</i>	1944	<i>1.37</i>	1944	<i>1.37</i>	236	
neos858960	1009850	976	97629	720000	7200	7200	1515774	<i>1.50</i>	1469	<i>1.51</i>	146933	<i>1.51</i>	720000	1.00	7200	1.00	7200	1.00	2911	
net12	2161	1479	15201	72698	402	93	2153	1.00	1464	0.99	14582	0.96	59822	<b>0.82</b>	254	<b>0.63</b>	112	<i>1.20</i>	497	$\checkmark$
netdiversion	76	1890	94015	96955	1601	41	84	<i>1.11</i>	1317	<b>0.70</b>	76615	<b>0.81</b>	78371	<b>0.81</b>	1026	<b>0.64</b>	41	0.98	191	
newdano	1307144	6819	5482	130091	2922	< 1	1390208	<i>1.06</i>	6909	1.01	6164	<i>1.12</i>	144565	<i>1.11</i>	3718	<i>1.27</i>	< 1	<i>1.29</i>	859	$\checkmark$
nobel-eu-DBE	982259	7200	720000	7314	2109	< 1	930113	<b>0.95</b>	7200	1.00	720001	1.00	6228	<b>0.85</b>	1865	<b>0.88</b>	1	<i>1.11</i>	1863	
noswot	317847	100	5	471	41	< 1	225645	<b>0.71</b>	71	<b>0.71</b>	0	<b>0.00</b>	328	<b>0.70</b>	< 1	<b>0.00</b>	< 1	<b>0.86</b>	996	$\checkmark$
ns1111636	685	7200	79344	235499	1458	18	768	<i>1.12</i>	7200	1.00	64997	<b>0.82</b>	287175	<i>1.22</i>	1683	<i>1.15</i>	17	0.98	88	
ns1116954	32	6292	629214	720001	7200	7200	75	<i>2.34</i>	7200	<i>1.14</i>	720003	<i>1.14</i>	720003	1.00	7200	1.00	7200	1.00	69	
ns1158817	1	611	61061	720000	7200	7200	1	1.00	601	0.98	60102	0.98	720000	1.00	7200	1.00	7200	1.00	0	
ns1208400	2631	1404	139067	140445	1391	1391	3481	<i>1.32</i>	916	<b>0.65</b>	89933	<b>0.65</b>	91579	<b>0.65</b>	899	<b>0.65</b>	899	<b>0.65</b>	783	
ns1456591	164400	7200	313603	554683	4262	1791	176915	<i>1.08</i>	7200	1.00	294435	<b>0.94</b>	546861	0.99	3206	<b>0.75</b>	1512	<b>0.84</b>	15000	
ns1606230	7286	6637	663697	396937	3966	488	3852	<b>0.53</b>	5977	<b>0.90</b>	597748	<b>0.90</b>	376522	<b>0.95</b>	3741	<b>0.94</b>	603	<i>1.23</i>	618	
ns1631475	193	7200	364633	695598	3309	1	139	<b>0.72</b>	7200	1.00	344935	<b>0.95</b>	694587	1.00	2748	<b>0.83</b>	1	0.98	42	
ns1644855	29	6610	661063	86840	1686	13	39	<i>1.32</i>	5955	<b>0.90</b>	595545	<b>0.90</b>	81585	<b>0.94</b>	3198	<i>1.90</i>	12	<b>0.93</b>	38	
ns1663818	1	7200	720198	720198	7200	7200	1	1.00	7200	1.00	720274	1.00	720274	1.00	7200	1.00	7200	1.00	34	
ns1685374	12	7200	720000	645708	4240	4240	19	<i>1.53</i>	7200	1.00	720002	1.00	642473	0.99	4144	0.98	4144	0.98	19	
ns1686196	13	14	1380	720000	7200	7200	1	<b>0.08</b>	12	<b>0.87</b>	1198	<b>0.87</b>	720000	1.00	7200	1.00	7200	1.00	32	
ns1688347	3898	188	7748	9152	149	67	2143	<b>0.55</b>	148	<b>0.79</b>	6035	<b>0.78</b>	7177	<b>0.78</b>	127	<b>0.85</b>	52	<b>0.77</b>	624	
ns1696083	25435	7200	579429	615171	6305	5526	23476	<b>0.92</b>	7200	1.00	500538	<b>0.86</b>	595131	0.97	5315	<b>0.84</b>	4663	<b>0.84</b>	6770	
ns1702808	166455	205	20496	720000	7200	7200	157751	<b>0.95</b>	188	<b>0.92</b>	18769	<b>0.92</b>	720000	1.00	7200	1.00	7200	1.00	204	
ns1745726	2	16	1649	720000	7200	7200	1	<b>0.50</b>	16	<b>0.94</b>	1550	<b>0.94</b>	720000	1.00	7200	1.00	7200	1.00	22	

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Instance	default						confdiving													
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$	$\mathbf{C}$	$\mathbf{I}$
ns1758913	24	2499	175606	176583	1321	121	1	<b>0.04</b>	1459	<b>0.58</b>	104102	<b>0.59</b>	105036	<b>0.59</b>	1459	<i>1.10</i>	123	1.02	48	$\checkmark$
ns1766074	992681	2365	236514	720000	7200	7200	1000176	1.01	2301	0.97	230129	0.97	720000	1.00	7200	1.00	7200	1.00	729	
ns1769397	273	61	6075	720000	7200	7200	39	<b>0.14</b>	54	<b>0.88</b>	5356	<b>0.88</b>	720000	1.00	7200	1.00	7200	1.00	298	
ns1778858	1611	7200	720001	720001	7200	7200	2762	<i>1.72</i>	7200	1.00	720001	1.00	720001	1.00	7200	1.00	7200	1.00	99	
ns1830653	9104	182	4765	8184	103	31	9846	<i>1.08</i>	178	0.98	4994	<i>1.05</i>	8515	1.04	135	<i>1.32</i>	27	<b>0.88</b>	1840	$\checkmark$
ns1853823	1	7200	699477	718973	34	33	1	1.00	7200	1.00	702123	1.00	721723	1.00	34	1.01	34	1.01	0	
ns1854840	1	7200	682991	712037	3606	11	1	1.00	7200	1.00	682991	1.00	710917	1.00	4804	<i>1.33</i>	11	0.96	30	
ns1904248	46	7200	110033	722082	15	10	25	<b>0.54</b>	7200	1.00	109799	1.00	720923	1.00	14	0.99	9	<b>0.92</b>	220	
ns1905797	10654	7200	720000	720000	7200	7200	5194	<b>0.49</b>	7200	1.00	720001	1.00	720001	1.00	7200	1.00	7200	1.00	976	
ns1905800	342245	7200	720001	720001	7200	7200	456303	<i>1.33</i>	7200	1.00	720000	1.00	720000	1.00	7200	1.00	7200	1.00	161	
ns1952667	11603	2024	202418	202404	2024	2024	20734	<i>1.79</i>	2969	<i>1.47</i>	296885	<i>1.47</i>	296854	<i>1.47</i>	2969	<i>1.47</i>	2969	<i>1.47</i>	464	
ns2081729	4548963	7200	720007	194693	1925	2	4538425	1.00	7200	1.00	720004	1.00	133820	<b>0.69</b>	207	<b>0.11</b>	3	<i>1.48</i>	27906	$\checkmark$
ns2118727	2	1488	148794	720000	7200	7200	1	<b>0.50</b>	495	<b>0.33</b>	49532	<b>0.33</b>	720000	1.00	7200	1.00	7200	1.00	0	
ns2124243	7677	7200	83265	199883	2894	140	7467	0.97	7200	1.00	85057	1.02	193520	0.97	2845	0.98	138	0.98	166	
ns2137859	5636	7200	276840	316954	3455	2	10965	<i>1.95</i>	7200	1.00	216032	<b>0.78</b>	261645	<b>0.83</b>	1451	<b>0.42</b>	2	0.99	1238	
ns4-pr3	351879	7200	137	498	3541	< 1	307564	<b>0.87</b>	7200	1.00	150	<i>1.10</i>	506	1.02	4582	<i>1.29</i>	< 1	<i>1.05</i>	6015	$\checkmark$
ns4-pr9	407986	7200	88	389	2726	1	430701	<i>1.06</i>	7200	1.00	85	0.97	359	<b>0.92</b>	458	<b>0.17</b>	1	1.01	4949	$\checkmark$
ns894236	9137	7200	391552	468824	3966	3877	7596	<b>0.83</b>	7200	1.00	270419	<b>0.69</b>	365746	<b>0.78</b>	3466	<b>0.87</b>	2627	<b>0.68</b>	2217	
ns894244	1377	7200	720001	657459	6533	6533	2494	<i>1.81</i>	6927	0.96	692653	0.96	552267	<b>0.84</b>	5745	<b>0.88</b>	5429	<b>0.83</b>	603	
ns894786	692	7200	720000	720000	7200	7200	429	<b>0.62</b>	7200	1.00	720001	1.00	720001	1.00	7200	1.00	7200	1.00	491	
ns894788	197986	5456	545650	545643	5456	5456	133380	<b>0.67</b>	3650	<b>0.67</b>	364991	<b>0.67</b>	364976	<b>0.67</b>	3650	<b>0.67</b>	3650	<b>0.67</b>	1209	
ns903616	1059	7200	664372	673163	6800	6591	840	<b>0.79</b>	7200	1.00	720001	<i>1.08</i>	720001	<i>1.07</i>	7200	<i>1.06</i>	7200	<i>1.09</i>	525	
ns930473	111	7200	258117	720000	2450	1725	60	<b>0.54</b>	7200	1.00	320948	<i>1.24</i>	720000	1.00	2450	1.00	2450	<i>1.42</i>	58	
nsr8k	64	7200	556442	562265	2122	9	78	<i>1.20</i>	7200	1.00	493327	<b>0.89</b>	501376	<b>0.89</b>	2936	<i>1.38</i>	8	<b>0.91</b>	39	
nu120-pr3	29857	7200	69494	116785	5495	1	40840	<i>1.37</i>	7200	1.00	61703	<b>0.89</b>	110575	<b>0.95</b>	5236	<b>0.95</b>	1	1.02	476	
nu60-pr9	76663	7200	6070	26522	3777	1	74736	0.97	7200	1.00	4983	<b>0.82</b>	24687	<b>0.93</b>	3562	<b>0.94</b>	1	0.98	767	$\checkmark$
opm2-z11-s8	428	7200	90346	273124	5019	< 1	353	<b>0.83</b>	7200	1.00	86975	0.96	271412	0.99	4802	0.96	< 1	1.04	568	
opm2-z12-s14	131	7200	182477	345977	5369	< 1	79	<b>0.60</b>	7200	1.00	164540	<b>0.90</b>	334148	0.97	3444	<b>0.64</b>	< 1	1.01	0	
opm2-z12-s7	293	7200	179740	339469	4662	< 1	89	<b>0.30</b>	7200	1.00	181263	1.01	336567	0.99	3402	<b>0.73</b>	< 1	1.03	1729	
opm2-z7-s2	3332	406	3614	7487	383	< 1	2437	<b>0.73</b>	348	<b>0.86</b>	4288	<i>1.19</i>	8071	<i>1.08</i>	318	<b>0.83</b>	< 1	<i>1.11</i>	215	$\checkmark$

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Instance	default						confdiving													
	N	T	PI	PDI	TtB	TtF	N	$\mathbf{N}_Q$	T	$\mathbf{T}_Q$	PI	$\mathbf{PI}_Q$	PDI	$\mathbf{PDI}_Q$	TtB	$\mathbf{TtB}_Q$	TtF	$\mathbf{TtF}_Q$	C	I
p100x588b	481749	7200	12686	43220	1136	< 1	521560	<i>1.08</i>	7200	1.00	16157	<i>1.27</i>	49039	<i>1.13</i>	3555	<i>3.13</i>	< 1	<b>0.88</b>	2820	
p2m2p1m1p0n100	57413493	7200	720000	720000	7200	7200	58852442	1.03	7200	1.00	720000	1.00	720000	1.00	7200	1.00	7200	1.00	7	
p6b	536562	7200	38900	197930	2785	< 1	536070	1.00	7200	1.00	38901	1.00	197963	1.00	2783	1.00	< 1	1.00	207	
p80x400b	1639027	7200	720008	32567	1926	< 1	1749867	<i>1.07</i>	7200	1.00	720000	1.00	31625	0.97	1186	<b>0.62</b>	< 1	1.00	4411	
pb-simp-nonunif	550	7200	376259	439168	3144	16	1622	<i>2.95</i>	7200	1.00	360748	0.96	423150	0.96	4413	<i>1.40</i>	17	1.04	1333	
pg	2946	653	1401	3859	564	< 1	3437	<i>1.17</i>	546	<b>0.84</b>	1188	<b>0.85</b>	3418	<b>0.89</b>	484	<b>0.86</b>	< 1	<i>1.20</i>	20	
pg5_34	145643	1556	257	753	997	< 1	190791	<i>1.31</i>	2926	<i>1.88</i>	399	<i>1.55</i>	492	<b>0.65</b>	1295	<i>1.30</i>	< 1	1.00	111	$\checkmark$
pigeon-10	15282073	5847	178	58632	825	< 1	8278432	<b>0.54</b>	4000	<b>0.68</b>	25	<b>0.14</b>	40022	<b>0.68</b>	< 1	<b>0.00</b>	< 1	1.00	2126	$\checkmark$
pigeon-11	9403959	7200	720000	65652	39	< 1	7218390	<b>0.77</b>	7200	1.00	720000	1.00	65493	1.00	1	<b>0.01</b>	< 1	1.00	2611	$\checkmark$
pigeon-12	4192790	7200	192	60176	579	< 1	8341419	<i>1.99</i>	7200	1.00	126	<b>0.66</b>	60115	1.00	2	<b>0.00</b>	< 1	1.00	4041	
pigeon-13	4505111	7200	366	55723	5	< 1	6482402	<i>1.44</i>	7200	1.00	240	<b>0.66</b>	55606	1.00	8	<i>1.59</i>	< 1	1.00	1864	
pigeon-19	6163473	7200	1396	39217	16	< 1	6412240	1.04	7200	1.00	958	<b>0.69</b>	38802	0.99	13	<b>0.81</b>	< 1	1.00	1935	$\checkmark$
probportfolio	1994756	7200	44632	303724	2548	< 1	2121779	<i>1.06</i>	7200	1.00	39311	<b>0.88</b>	299582	0.99	2832	<i>1.11</i>	< 1	0.97	31793	
protfold	12280	7200	288197	360755	3721	< 1	12028	0.98	7200	1.00	307512	<i>1.07</i>	377307	<i>1.05</i>	4595	<i>1.23</i>	< 1	0.99	1381	
pw-myciel4	637908	6456	1814	231779	51	1	412894	<b>0.65</b>	3847	<b>0.60</b>	1393	<b>0.77</b>	91348	<b>0.39</b>	52	1.01	1	<b>0.93</b>	9471	$\checkmark$
qiu	10040	71	2198	4905	45	< 1	11018	<i>1.10</i>	76	<i>1.07</i>	1898	<b>0.86</b>	5203	<i>1.06</i>	25	<b>0.56</b>	< 1	<i>1.08</i>	23	$\checkmark$
queens-30	8881	7200	27163	325949	3775	< 1	8650	0.97	7200	1.00	25965	0.96	325395	1.00	3580	<b>0.95</b>	< 1	<b>0.75</b>	1	
r80x800	475310	7200	771	10565	2938	< 1	507299	<i>1.07</i>	7200	1.00	679	<b>0.88</b>	10383	0.98	2038	<b>0.69</b>	< 1	<b>0.89</b>	363	
rail01	45	7200	720001	679103	6770	6725	49	<i>1.10</i>	7200	1.00	720002	1.00	692616	1.02	7117	<i>1.05</i>	6893	1.03	32	
rail02	1	7200	720005	720005	7200	7200	1	1.00	7200	1.00	720002	1.00	720002	1.00	7200	1.00	7200	1.00	0	
rail03	1	7200	720003	720003	7200	7200	1	1.00	7200	1.00	720004	1.00	720004	1.00	7200	1.00	7200	1.00	0	
rail507	875	237	599	1085	148	3	936	<i>1.07</i>	247	1.04	604	1.01	1095	1.01	165	<i>1.11</i>	3	0.98	1	
ramos3	33	7200	116043	290943	< 1	< 1	33	1.02	7200	1.00	116043	1.00	290543	1.00	< 1	0.97	< 1	1.00	0	
ran14x18	715043	2282	228182	6229	1267	< 1	801021	<i>1.12</i>	2554	<i>1.12</i>	255441	<i>1.12</i>	7032	<i>1.13</i>	1665	<i>1.31</i>	< 1	1.00	567	
ran14x18-disj-8	510977	2232	223177	5595	1000	< 1	447088	<b>0.87</b>	1954	<b>0.88</b>	195351	<b>0.88</b>	5268	<b>0.94</b>	860	<b>0.86</b>	< 1	<i>1.29</i>	215	
ran16x16	11379	85	145	422	59	< 1	14450	<i>1.27</i>	88	1.03	119	<b>0.82</b>	396	<b>0.94</b>	51	<b>0.87</b>	< 1	<b>0.86</b>	22	
reblock166	627704	6973	697346	21964	4813	< 1	522439	<b>0.83</b>	6910	0.99	690980	0.99	23143	<i>1.05</i>	3866	<b>0.80</b>	< 1	1.00	11400	$\checkmark$
reblock354	355336	7200	4756	6875	4568	< 1	351233	0.99	7200	1.00	5558	<i>1.17</i>	7895	<i>1.15</i>	4827	<i>1.06</i>	< 1	<i>1.27</i>	17525	
reblock420	157942	7200	33027	43654	6582	< 1	125861	<b>0.80</b>	7200	1.00	41006	<i>1.24</i>	57314	<i>1.31</i>	6051	<b>0.92</b>	< 1	1.04	10944	$\checkmark$
reblock67	55518	239	1449	1897	143	< 1	54433	0.98	323	<i>1.35</i>	1303	<b>0.90</b>	1738	<b>0.92</b>	153	<i>1.07</i>	< 1	1.00	3575	

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Instance	default						confdiving													
	N	T	PI	PDI	TtB	TtF	N	$N_Q$	T	$T_Q$	PI	$PI_Q$	PDI	$PDI_Q$	TtB	$TtB_Q$	TtF	$TtF_Q$	C	I
rmatr100-p10	800	186	823	2340	93	< 1	807	1.01	187	1.01	837	1.02	2362	1.01	98	<i>1.05</i>	< 1	0.99	40	
rmatr100-p5	398	286	716	4551	32	< 1	403	1.01	291	1.01	712	0.99	4603	1.01	32	0.99	< 1	<b>0.92</b>	69	
rmatr200-p10	338	7200	58795	181663	4778	3	342	1.01	7200	1.00	60003	1.02	184014	1.01	5236	<i>1.10</i>	4	1.03	3	
rmatr200-p20	2832	7200	14256	97123	4146	3	2689	<b>0.95</b>	7200	1.00	13936	0.98	97913	1.01	1139	<b>0.27</b>	3	0.99	155	
rmatr200-p5	344	7200	34982	185486	5014	5	334	0.97	7200	1.00	35337	1.01	185415	1.00	6061	<i>1.21</i>	5	1.01	1	
rmine10	28374	7200	28521	30778	2516	< 1	37455	<i>1.32</i>	7200	1.00	24727	<b>0.87</b>	27301	<b>0.89</b>	1427	<b>0.57</b>	< 1	0.98	2992	$\checkmark$
rmine14	8	7200	608142	613075	88	< 1	8	<i>1.07</i>	7200	1.00	600056	0.99	605052	0.99	1207	<i>13.71</i>	< 1	1.03	244	
rmine21	1	7200	366647	673774	556	2	1	1.00	7200	1.00	367763	1.00	673934	1.00	577	1.04	2	0.99	0	
rmine25	1	7200	673877	685881	1196	5	1	1.00	7200	1.00	673835	1.00	685850	1.00	1191	1.00	5	1.01	0	
rmine6	88906	944	910	1104	649	< 1	103842	<i>1.17</i>	1078	<i>1.14</i>	808	<b>0.89</b>	1022	<b>0.93</b>	702	<i>1.08</i>	< 1	1.00	261	
rocII-4-11	7514	2022	57922	91613	1795	141	10725	<i>1.43</i>	2112	1.04	50871	<b>0.88</b>	85683	<b>0.94</b>	1795	1.00	103	<b>0.73</b>	858	$\checkmark$
rocII-7-11	1126	7200	549159	623554	4159	3693	1295	<i>1.15</i>	7200	1.00	515261	<b>0.94</b>	604415	0.97	5076	<i>1.22</i>	2381	<b>0.64</b>	151	
rocII-9-11	636	7200	600967	663050	4901	4693	705	<i>1.11</i>	7200	1.00	688394	<i>1.15</i>	704878	<i>1.06</i>	6616	<i>1.35</i>	6210	<i>1.32</i>	176	
rococoB10-011000	126998	7200	18428	136207	3721	< 1	126061	0.99	7200	1.00	16208	<b>0.88</b>	134770	0.99	3049	<b>0.82</b>	< 1	<b>0.93</b>	1526	
rococoC10-001000	64603	1178	1242	6020	696	< 1	73925	<i>1.14</i>	1437	<i>1.22</i>	1504	<i>1.21</i>	6694	<i>1.11</i>	723	1.04	< 1	0.97	670	$\checkmark$
rococoC11-011100	36599	7200	39398	157326	4982	< 1	32214	<b>0.88</b>	7200	1.00	41572	<i>1.06</i>	166723	<i>1.06</i>	5030	1.01	< 1	0.99	258	
rococoC12-111000	13127	7200	76117	143098	1863	< 1	12330	<b>0.94</b>	7200	1.00	88979	<i>1.17</i>	153846	<i>1.08</i>	2926	<i>1.57</i>	< 1	<i>1.11</i>	1855	
roll3000	3357	69	597	703	59	4	3311	0.99	64	<b>0.94</b>	606	1.01	709	1.01	53	<b>0.90</b>	4	<i>1.14</i>	199	
rvb-sub	48155	7200	350237	566019	4105	4	47525	0.99	7200	1.00	266167	<b>0.76</b>	531109	<b>0.94</b>	4196	1.02	4	1.02	< 1	
satellites1-25	1121	811	67687	76836	699	56	161	<b>0.14</b>	702	<b>0.87</b>	33850	<b>0.50</b>	60370	<b>0.79</b>	530	<b>0.76</b>	56	1.00	529	$\checkmark$
satellites2-60-fs	46	7200	720000	700690	2811	111	6	<b>0.13</b>	7200	1.00	720001	1.00	710409	1.01	3465	<i>1.23</i>	116	<i>1.05</i>	1577	$\checkmark$
sct1	2867	7200	106076	186709	3359	1	3134	<i>1.09</i>	7200	1.00	102015	0.96	182053	0.98	2662	<b>0.79</b>	1	0.99	14	
sct32	121419	7200	336363	413174	4999	61	107228	<b>0.88</b>	7200	1.00	366727	<i>1.09</i>	437076	<i>1.06</i>	3568	<b>0.71</b>	65	<i>1.06</i>	1294	
sct5	12718	7200	64358	64591	3821	6	20141	<i>1.58</i>	7200	1.00	51421	<b>0.80</b>	51659	<b>0.80</b>	5059	<i>1.32</i>	6	1.02	267	
set3-10	190247	7200	95089	415454	6032	< 1	148319	<b>0.78</b>	7200	1.00	107262	<i>1.13</i>	422212	1.02	5674	<b>0.94</b>	< 1	1.00	721	$\checkmark$
set3-15	220584	7200	134545	427471	6029	< 1	207964	<b>0.94</b>	7200	1.00	144219	<i>1.07</i>	438534	1.03	6271	1.04	< 1	<b>0.93</b>	850	
set3-20	182234	7200	76720	404179	6122	< 1	184747	1.01	7200	1.00	95488	<i>1.24</i>	410509	1.02	5033	<b>0.82</b>	< 1	1.01	880	
seymour	210806	7200	1715	12269	3555	< 1	209922	1.00	7200	1.00	1743	1.02	12536	1.02	3889	<i>1.09</i>	< 1	<b>0.86</b>	770	
seymour-disj-10	97420	7200	2025	13136	2992	< 1	97507	1.00	7200	1.00	1492	<b>0.74</b>	12452	<b>0.95</b>	1980	<b>0.66</b>	< 1	<b>0.88</b>	702	
shipsched	548252	7200	172165	460302	5477	44	591187	<i>1.08</i>	7200	1.00	131956	<b>0.77</b>	450015	0.98	5426	0.99	42	0.96	1671	

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Instance	default						confdiving													
	N	T	PI	PDI	TtB	TtF	N	$\mathbf{N}_Q$	T	$\mathbf{T}_Q$	PI	$\mathbf{PI}_Q$	PDI	$\mathbf{PDI}_Q$	TtB	$\mathbf{TtB}_Q$	TtF	$\mathbf{TtF}_Q$	C	I
shs1023	13	7200	710294	710876	7093	7093	12	<b>0.90</b>	7200	1.00	721468	1.02	721468	1.01	7200	1.02	7200	1.02	4	
siena1	1074	7200	590538	610757	5336	48	1008	<b>0.94</b>	7200	1.00	570771	0.97	594079	0.97	5663	<i>1.06</i>	47	0.99	873	
sing161	6	7200	503159	508104	4065	3676	4	<b>0.55</b>	7200	1.00	496150	0.99	501243	0.99	4119	1.01	3552	0.97	138	
sing2	3373	7200	55051	60556	4357	4	3753	<i>1.11</i>	7200	1.00	46711	<b>0.85</b>	52213	<b>0.86</b>	4155	<b>0.95</b>	5	<i>1.10</i>	646	
sing245	2	7200	265581	272084	6788	439	2	<i>1.18</i>	7200	1.00	266290	1.00	272845	1.00	4522	<b>0.67</b>	440	1.00	1270	
sing359	5	7200	387221	391941	5004	2946	4	<b>0.89</b>	7200	1.00	431358	<i>1.11</i>	435538	<i>1.11</i>	5835	<i>1.17</i>	3182	<i>1.08</i>	411	
sp97ar	21186	7200	118749	715977	6175	1	19648	<b>0.93</b>	7200	1.00	123306	1.04	716007	1.00	4965	<b>0.80</b>	1	0.97	317	
sp98ic	47572	7200	22132	30460	6050	1	55434	<i>1.17</i>	7200	1.00	19883	<b>0.90</b>	28943	<b>0.95</b>	4513	<b>0.75</b>	1	1.00	6444	$\checkmark$
sp98ir	4915	80	271	345	56	1	6741	<i>1.37</i>	101	<i>1.27</i>	295	<i>1.09</i>	385	<i>1.12</i>	68	<i>1.21</i>	1	0.96	308	
stockholm	6554	7200	45257	646955	1148	14	6684	1.02	7200	1.00	42496	<b>0.94</b>	639119	0.99	1607	<i>1.40</i>	14	1.00	213	
stp3d	21	7200	720166	720166	7200	7200	17	<b>0.84</b>	7200	1.00	721142	1.00	721142	1.00	7200	1.00	7200	1.00	105	
sts405	61247	7200	16338	322026	2839	< 1	61413	1.00	7200	1.00	16342	1.00	322088	1.00	2852	1.00	< 1	<b>0.86</b>	60	
sts729	373	7200	7419	428216	2658	< 1	334	<b>0.90</b>	7200	1.00	7441	1.00	428296	1.00	2727	1.03	< 1	0.98	5	
swath	919716	7200	24996	117779	5359	< 1	865503	<b>0.94</b>	7200	1.00	19609	<b>0.78</b>	118284	1.00	5596	1.04	< 1	<b>0.93</b>	4180	
t1717	3536	7200	197784	301446	2859	5	3489	0.99	7200	1.00	195477	0.99	299533	0.99	2678	<b>0.94</b>	5	0.99	183	
t1722	20166	7200	100790	186720	3743	1	17601	<b>0.87</b>	7200	1.00	112212	<i>1.11</i>	197081	<i>1.06</i>	2696	<b>0.72</b>	1	0.98	2827	
tanglegram1	53	433	1378	26392	338	< 1	47	<b>0.90</b>	397	<b>0.92</b>	1148	<b>0.83</b>	24341	<b>0.92</b>	301	<b>0.89</b>	< 1	<i>1.05</i>	< 1	
tanglegram2	3	4	23	418	4	< 1	3	1.00	4	1.00	23	1.00	419	1.00	4	1.00	< 1	<b>0.78</b>	84	
timtab1	58161	82	677	1478	57	3	51476	<b>0.89</b>	70	<b>0.86</b>	456	<b>0.67</b>	1242	<b>0.84</b>	47	<b>0.82</b>	2	<b>0.72</b>	248	$\checkmark$
toll-like	197463	7200	9717	184379	4725	< 1	185164	<b>0.94</b>	7200	1.00	7446	<b>0.77</b>	177164	0.96	5348	<i>1.13</i>	< 1	1.00	706	
triptim1	180	1655	38918	38914	931	367	33	<b>0.18</b>	820	<b>0.50</b>	42019	<i>1.08</i>	42008	<i>1.08</i>	689	<b>0.74</b>	389	<i>1.06</i>	73	
triptim2	58	7200	361958	364474	4311	2252	53	<b>0.91</b>	7200	1.00	318792	<b>0.88</b>	334104	<b>0.92</b>	3575	<b>0.83</b>	1950	<b>0.87</b>	115	
triptim3	141	7200	279277	279520	3957	2789	95	<b>0.67</b>	7200	1.00	236926	<b>0.85</b>	237331	<b>0.85</b>	3362	<b>0.85</b>	2285	<b>0.82</b>	392	
tw-myciel4	97963	7200	975	363920	55	< 1	101694	1.04	7200	1.00	902	<b>0.93</b>	365797	1.01	65	<i>1.19</i>	< 1	1.03	12167	$\checkmark$
uc-case11	3533	7200	11982	22904	3773	4	3560	1.01	7200	1.00	13969	<i>1.17</i>	24849	<i>1.08</i>	2787	<b>0.74</b>	4	1.03	21	
uc-case3	810	7200	12130	14056	4895	6	5111	<i>6.31</i>	7200	1.00	13714	<i>1.13</i>	15587	<i>1.11</i>	5368	<i>1.10</i>	6	1.02	637	
uct-subprob	337922	7200	2192	38567	1210	< 1	320685	<b>0.95</b>	7108	0.99	2402	<i>1.10</i>	38245	0.99	1485	<i>1.23</i>	< 1	<b>0.83</b>	2864	
umts	1109536	4530	453035	1900	3907	< 1	913596	<b>0.82</b>	3796	<b>0.84</b>	379612	<b>0.84</b>	1445	<b>0.76</b>	3290	<b>0.84</b>	< 1	1.01	1114	
unitcal_7	274	399	12613	12627	345	126	46	<b>0.17</b>	295	<b>0.74</b>	10562	<b>0.84</b>	10577	<b>0.84</b>	291	<b>0.84</b>	105	<b>0.83</b>	9144	$\checkmark$
usAbbrv-8-25_70	495346	7200	10015	75526	2663	< 1	614117	<i>1.24</i>	7200	1.00	7808	<b>0.78</b>	71908	<b>0.95</b>	2746	1.03	< 1	<i>1.08</i>	79097	$\checkmark$

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Instance	default						confdiving													
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$	$\mathbf{C}$	$\mathbf{I}$
van	2017	7200	60428	333458	1742	1	2355	<i>1.17</i>	7200	1.00	57324	<b>0.95</b>	327362	0.98	2041	<i>1.17</i>	1	1.01	127	$\checkmark$
vpphard	10716	7200	474562	719616	4700	581	5296	<b>0.49</b>	7200	1.00	556158	<i>1.17</i>	720001	1.00	4617	0.98	624	<i>1.07</i>	1109	
vpphard2	4519	7200	540696	713490	4469	601	4317	0.96	7200	1.00	570384	<i>1.05</i>	714510	1.00	5243	<i>1.17</i>	565	<b>0.94</b>	464	
wachplan	294588	3579	357878	41079	15	15	236908	<b>0.80</b>	2976	<b>0.83</b>	297558	<b>0.83</b>	33667	<b>0.82</b>	7	<b>0.46</b>	7	<b>0.46</b>	10037	
wnq-n100-mw99-14	183	7200	651801	662305	5963	4608	453	<i>2.48</i>	7200	1.00	582378	<b>0.89</b>	602466	<b>0.91</b>	6082	1.02	4421	0.96	583	
zib54-UUE	59368	1798	2188	19591	169	< 1	55417	<b>0.93</b>	1791	1.00	2445	<i>1.12</i>	17378	<b>0.89</b>	160	<b>0.95</b>	< 1	<b>0.92</b>	237	$\checkmark$
geom.	5422.28	2128.28	–	49550.95	1072.26	4.64	5087.18	0.94	2088.87	0.98	–	–	48595.88	0.98	974.41	0.91	4.49	0.97	–	
shgeom.	9717.20	2174.16	19987.46	50237.30	1123.48	17.15	9745.33	1.00	2133.03	0.98	19221.20	0.96	49346.95	0.98	1045.67	0.93	16.76	0.98	346.53	

**Table 6:** Detailed computational results on COR@L test set. The table shows the absolute and relative numbers of nodes ( $\mathbf{N}$ ,  $\mathbf{N}_Q$ ), solving time ( $\mathbf{T}$ ,  $\mathbf{T}_Q$ ), primal integral ( $\mathbf{PI}$ ,  $\mathbf{PI}_Q$ ), primal-dual integral ( $\mathbf{PDI}$ ,  $\mathbf{PDI}_Q$ ), time to best ( $\mathbf{TtB}$ ,  $\mathbf{TtB}_Q$ ) and first solution ( $\mathbf{TtF}$ ,  $\mathbf{TtF}_Q$ ), and number of conflicts found by conflict diving ( $\mathbf{C}$ ). The right-most column ( $\mathbf{I}$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving													$\mathbf{C}$	$\mathbf{I}$
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$			
22433	4	3	26	26	3	< 1	4	0.96	3	0.99	36	<i>1.39</i>	36	<i>1.39</i>	3	0.98	< 1	<i>1.44</i>	1146		
23588	687	5	82	94	4	1	515	<b>0.75</b>	4	<b>0.89</b>	84	1.03	96	1.02	4	<b>0.89</b>	1	<i>1.05</i>	140		
Test3	2	6	190	196	5	2	2	1.00	6	0.98	193	1.01	198	1.01	5	1.02	2	1.00	2581	$\checkmark$	
aligninq	928	20	418	439	7	4	1321	<i>1.42</i>	25	<i>1.22</i>	583	<i>1.39</i>	607	<i>1.38</i>	9	<i>1.16</i>	6	<i>1.40</i>	1044		
bc	15435	1024	7062	27579	85	3	13962	<b>0.90</b>	1859	<i>1.82</i>	15413	<i>2.18</i>	51748	<i>1.88</i>	163	<i>1.91</i>	3	1.00	43		
bc1	3249	208	5661	7799	200	2	3687	<i>1.13</i>	209	1.00	3172	<b>0.56</b>	5800	<b>0.74</b>	195	0.98	2	0.99	21	$\checkmark$	
bienst1	11358	123	372	1759	25	< 1	10563	<b>0.93</b>	117	0.96	221	<b>0.59</b>	1721	0.98	30	<i>1.18</i>	< 1	<b>0.90</b>	278	$\checkmark$	
bienst2	69421	637	1005	10700	259	< 1	59356	<b>0.86</b>	511	<b>0.80</b>	453	<b>0.45</b>	9178	<b>0.86</b>	157	<b>0.61</b>	< 1	<i>1.29</i>	257	$\checkmark$	
binkar10_1	2505	32	39	48	17	< 1	3200	<i>1.28</i>	42	<i>1.31</i>	29	<b>0.74</b>	42	<b>0.88</b>	16	<b>0.93</b>	< 1	<b>0.80</b>	3012	$\checkmark$	
d10200	760704	7200	1325	1501	3991	< 1	835075	<i>1.10</i>	7200	1.00	1268	0.96	1444	0.96	4601	<i>1.15</i>	< 1	1.03	4810		
d20200	98799	7200	2910	7109	773	1	105436	<i>1.07</i>	7200	1.00	3498	<i>1.20</i>	7696	<i>1.08</i>	602	<b>0.78</b>	1	1.01	1461		
dano3_3	10	155	1515	3059	135	15	10	<b>0.93</b>	161	1.04	1528	1.01	3105	1.01	142	<i>1.05</i>	15	1.01	6568		
dano3_4	8	186	1238	3047	81	12	8	<i>1.09</i>	189	1.02	1237	1.00	3040	1.00	100	<i>1.25</i>	12	1.00	10386		
dano3_5	194	430	1430	3360	383	12	177	<b>0.91</b>	451	<i>1.05</i>	1427	1.00	3388	1.01	403	<i>1.05</i>	12	1.00	4	$\checkmark$	
fiball	11540	947	2705	2874	947	1	6147	<b>0.53</b>	642	<b>0.68</b>	2033	<b>0.75</b>	2198	<b>0.76</b>	642	<b>0.68</b>	1	1.00	313		
germanrr	2329	7200	50605	58179	3747	435	2882	<i>1.24</i>	7200	1.00	54978	<i>1.09</i>	62585	<i>1.08</i>	3746	1.00	474	<i>1.09</i>	299		
haprp	1	1	4	7	< 1	< 1	1	1.00	1	1.00	2	<b>0.54</b>	6	<b>0.78</b>	< 1	<i>1.14</i>	< 1	<b>0.95</b>	23	$\checkmark$	
leo1	81384	7200	28527	53482	4138	< 1	66433	<b>0.82</b>	7200	1.00	23591	<b>0.83</b>	49235	<b>0.92</b>	5153	<i>1.25</i>	< 1	0.97	103		
leo2	93537	7200	79009	720000	3276	1	92595	0.99	7200	1.00	77495	0.98	720001	1.00	4430	<i>1.35</i>	1	0.97	1820		
lrn	2129	7200	226196	226298	6489	2	2684	<i>1.26</i>	7200	1.00	128781	<b>0.57</b>	129070	<b>0.57</b>	6549	1.01	2	0.97	690		
mcf2	1177174	4389	977	12896	227	7	1155238	0.98	4252	0.97	1437	<i>1.47</i>	13826	<i>1.07</i>	834	<i>3.68</i>	7	<b>0.94</b>	1012		
mcsched	16226	356	151	2203	228	< 1	16328	1.01	286	<b>0.80</b>	140	<b>0.93</b>	1750	<b>0.79</b>	161	<b>0.70</b>	< 1	1.04	21	$\checkmark$	
mkc1	613835	1115	60	66	487	< 1	57540	<b>0.09</b>	200	<b>0.18</b>	57	<b>0.95</b>	62	<b>0.94</b>	59	<b>0.12</b>	< 1	<i>1.17</i>	15	$\checkmark$	
nag	52436	7200	237509	588866	5453	223	62161	<i>1.19</i>	7200	1.00	216375	<b>0.91</b>	584059	0.99	5417	0.99	158	<b>0.71</b>	3057	$\checkmark$	
neos-1053234	578678	6176	21	52514	2708	< 1	1063447	<i>1.84</i>	6296	1.02	22	1.01	55254	<i>1.05</i>	2913	<i>1.08</i>	< 1	0.97	765		
neos-1053591	4525	6	12	14	2	< 1	3264	<b>0.72</b>	4	<b>0.77</b>	11	0.99	15	<i>1.10</i>	2	<b>0.85</b>	< 1	0.96	32	$\checkmark$	
neos-1056905	7754399	5801	13089	50502	1143	< 1	5910080	<b>0.76</b>	5142	<b>0.89</b>	19136	<i>1.46</i>	51309	1.02	3081	<i>2.70</i>	< 1	1.00	15828	$\checkmark$	
neos-1061020	2746	550	10526	11042	465	99	4187	<i>1.52</i>	723	<i>1.31</i>	14484	<i>1.38</i>	15013	<i>1.36</i>	460	0.99	138	<i>1.39</i>	195		
neos-1062641	1	1	10	9	< 1	< 1	1	1.00	1	1.00	10	1.00	8	<b>0.92</b>	< 1	<b>0.92</b>	< 1	<b>0.90</b>	0		

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**Table 6:** Detailed computational results on CORAL test set. The table shows the absolute and relative numbers of nodes ( $\mathbf{N}$ ,  $\mathbf{N}_Q$ ), solving time ( $\mathbf{T}$ ,  $\mathbf{T}_Q$ ), primal integral ( $\mathbf{PI}$ ,  $\mathbf{PI}_Q$ ), primal-dual integral ( $\mathbf{PDI}$ ,  $\mathbf{PDI}_Q$ ), time to best ( $\mathbf{TtB}$ ,  $\mathbf{TtB}_Q$ ) and first solution ( $\mathbf{TtF}$ ,  $\mathbf{TtF}_Q$ ), and number of conflicts found by conflict diving ( $\mathbf{C}$ ). The right-most column ( $\mathbf{I}$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving												$\mathbf{C}$	$\mathbf{I}$
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$		
neos-1067731	180780	7200	830	217890	2185	< 1	184254	1.02	7200	1.00	1036	<i>1.25</i>	214547	0.98	1943	<b>0.89</b>	< 1	1.00	588	$\checkmark$
neos-1096528	23559	7200	31412	73026	1217	245	24332	1.03	7200	1.00	29369	<b>0.93</b>	70204	0.96	1153	<b>0.95</b>	215	<b>0.87</b>	483	$\checkmark$
neos-1109824	6851	101	615	1082	19	5	5825	<b>0.85</b>	79	<b>0.78</b>	333	<b>0.54</b>	668	<b>0.62</b>	13	<b>0.71</b>	2	<b>0.32</b>	252	$\checkmark$
neos-1120495	18	9	260	290	8	1	18	1.00	12	<i>1.35</i>	246	<b>0.95</b>	284	0.98	11	<i>1.34</i>	< 1	<b>0.62</b>	34	$\checkmark$
neos-1121679	27499670	7200	344297	720013	1608	< 1	28832486	<i>1.05</i>	7200	1.00	355771	1.03	720003	1.00	2977	<i>1.85</i>	< 1	1.00	33736	
neos-1122047	1	4	435	436	4	4	1	1.00	5	1.04	455	<i>1.05</i>	455	1.04	5	1.04	5	1.04	0	
neos-1126860	4183	697	1464	17149	23	11	4343	1.04	727	1.04	1456	0.99	14854	<b>0.87</b>	104	<i>4.52</i>	11	0.97	29	
neos-1151496	713	52	2956	4173	36	27	726	1.02	55	<i>1.07</i>	3250	<i>1.10</i>	4526	<i>1.08</i>	39	<i>1.09</i>	30	<i>1.11</i>	102	
neos-1171448	127	1138	824	907	1138	< 1	174	<i>1.37</i>	1873	<i>1.65</i>	889	<i>1.08</i>	972	<i>1.07</i>	1152	1.01	< 1	<i>1.24</i>	0	
neos-1171692	665	576	529	538	576	< 1	203	<b>0.30</b>	138	<b>0.24</b>	387	<b>0.73</b>	398	<b>0.74</b>	138	<b>0.24</b>	< 1	<b>0.86</b>	4	
neos-1171737	4349	7200	10262	10269	1713	< 1	4005	<b>0.92</b>	7200	1.00	11432	<i>1.11</i>	11437	<i>1.11</i>	774	<b>0.45</b>	< 1	<b>0.88</b>	1	
neos-1173026	1	1	18	18	< 1	< 1	1	1.00	1	1.00	19	<i>1.05</i>	19	1.01	< 1	1.01	< 1	<i>1.06</i>	0	
neos-1200887	22628	37	41	161	4	< 1	28067	<i>1.24</i>	41	<i>1.13</i>	40	0.96	170	<i>1.06</i>	3	<b>0.81</b>	< 1	1.00	108	
neos-1208069	2642	101	9369	9514	101	82	1245	<b>0.47</b>	109	<i>1.08</i>	10713	<i>1.14</i>	10714	<i>1.13</i>	109	<i>1.08</i>	105	<i>1.29</i>	218	
neos-1208135	2339	231	17591	21219	228	98	5430	<i>2.32</i>	465	<i>2.01</i>	37406	<i>2.13</i>	45797	<i>2.16</i>	464	<i>2.04</i>	236	<i>2.42</i>	1489	
neos-1211578	184819	66	9	94	1	< 1	176834	0.96	66	0.99	10	<i>1.06</i>	93	0.99	1	1.01	< 1	1.00	882	
neos-1215259	1973	77	2955	3972	49	26	3174	<i>1.61</i>	99	<i>1.29</i>	2732	<b>0.92</b>	4371	<i>1.10</i>	62	<i>1.28</i>	19	<b>0.73</b>	348	
neos-1215891	4407	633	1773	1822	87	18	4947	<i>1.12</i>	520	<b>0.82</b>	1182	<b>0.67</b>	1224	<b>0.67</b>	67	<b>0.77</b>	12	<b>0.66</b>	145	
neos-1223462	284	165	16450	16456	165	165	281	0.99	163	0.99	16300	0.99	16298	0.99	163	0.99	163	0.99	33	
neos-1224597	1	1	121	123	1	1	1	1.00	2	<i>1.59</i>	147	<i>1.21</i>	145	<i>1.19</i>	2	<i>1.59</i>	1	<i>1.08</i>	5	
neos-1228986	123904	57	9	212	18	< 1	174959	<i>1.41</i>	69	<i>1.20</i>	3	<b>0.39</b>	189	<b>0.89</b>	4	<b>0.20</b>	< 1	1.00	1062	$\checkmark$
neos-1281048	218	10	546	568	8	4	327	<i>1.50</i>	11	<i>1.16</i>	735	<i>1.35</i>	755	<i>1.33</i>	10	<i>1.19</i>	5	<i>1.22</i>	203	
neos-1311124	15287825	7200	20	3976	2926	< 1	15720083	1.03	7200	1.00	20	0.98	3976	1.00	406	<b>0.14</b>	< 1	1.00	1944	
neos-1324574	99838	7200	10	217293	2095	< 1	127864	<i>1.28</i>	7200	1.00	10	1.00	205507	<b>0.95</b>	3853	<i>1.84</i>	< 1	1.00	4078	
neos-1330346	238656	5850	10	143676	307	< 1	234937	0.98	5496	<b>0.94</b>	10	1.00	134008	<b>0.93</b>	1457	<i>4.75</i>	< 1	<i>1.06</i>	1078	
neos-1330635	1	1	12	16	< 1	< 1	1	1.00	1	1.01	18	<i>1.49</i>	31	<i>1.93</i>	< 1	<i>2.27</i>	< 1	1.02	42	$\checkmark$
neos-1337307	547670	7200	8981	9618	1068	90	562102	1.03	7200	1.00	8220	<b>0.92</b>	8704	<b>0.90</b>	222	<b>0.21</b>	82	<b>0.91</b>	2853	
neos-1337489	184819	66	10	94	1	< 1	176834	0.96	66	1.00	9	<b>0.90</b>	94	1.00	1	1.00	< 1	1.00	882	
neos-1346382	7765465	7200	16	8108	3107	< 1	8433384	<i>1.09</i>	7200	1.00	15	<b>0.94</b>	8107	1.00	1283	<b>0.41</b>	< 1	1.00	159390	
neos-1354092	636	7200	720000	720000	7200	7200	489	<b>0.77</b>	7200	1.00	720001	1.00	720001	1.00	7200	1.00	7200	1.00	29	

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Instance	default						confdiving													$\mathbf{C}$	$\mathbf{I}$
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$			
neos-1367061	1	31	1381	2432	31	1	1	1.00	31	1.01	1396	1.01	2462	1.01	31	1.01	1	1.00	0		
neos-1396125	40507	349	3562	9858	164	29	49225	<i>1.22</i>	360	1.03	2451	<b>0.69</b>	8666	<b>0.88</b>	177	<i>1.08</i>	24	<b>0.81</b>	309 $\checkmark$		
neos-1407044	59	7200	720000	720000	7200	7200	98	<i>1.65</i>	7200	1.00	720000	1.00	720000	1.00	7200	1.00	7200	1.00	13		
neos-1413153	2	4	172	225	4	< 1	2	<b>0.75</b>	4	1.01	151	<b>0.88</b>	210	<b>0.93</b>	4	1.02	< 1	0.98	33 $\checkmark$		
neos-1415183	2	7	432	476	7	< 1	2	<i>1.20</i>	8	<i>1.16</i>	423	0.98	496	1.04	8	<i>1.16</i>	< 1	<b>0.89</b>	123 $\checkmark$		
neos-1417043	1	1207	120733	120733	1207	1207	1	1.00	1205	1.00	120517	1.00	120517	1.00	1205	1.00	1205	1.00	0		
neos-1420205	11093	6	7	146	< 1	< 1	2500	<b>0.23</b>	3	<b>0.49</b>	7	1.02	103	<b>0.70</b>	< 1	<i>1.72</i>	< 1	<b>0.82</b>	37 $\checkmark$		
neos-1420546	1509	7200	4474	36995	3844	< 1	1514	1.00	7200	1.00	4482	1.00	37021	1.00	3844	1.00	< 1	1.00	< 1		
neos-1420790	103191	7200	5964	47472	3754	< 1	132819	<i>1.29</i>	7200	1.00	7239	<i>1.21</i>	48544	1.02	4382	<i>1.17</i>	< 1	1.00	15541		
neos-1423785	32621	7200	189078	428911	5518	4	45184	<i>1.39</i>	7200	1.00	187735	0.99	432168	1.01	6264	<i>1.14</i>	4	0.98	254 $\checkmark$		
neos-1425699	1	1	0	< 1	< 1	< 1	1	1.00	1	1.00	0	1.00	< 1	<i>2.00</i>	< 1	1.00	< 1	1.00	0 $\checkmark$		
neos-1426635	7800036	7200	16	8107	3028	< 1	8479862	<i>1.09</i>	7200	1.00	15	<b>0.95</b>	8107	1.00	1270	<b>0.42</b>	< 1	1.00	158694		
neos-1426662	1971233	7200	67	76481	2826	< 1	1772642	<b>0.90</b>	7200	1.00	68	1.00	75661	0.99	1318	<b>0.47</b>	< 1	1.00	8312		
neos-1427181	2255980	7200	20	13277	361	< 1	3086138	<i>1.37</i>	7200	1.00	21	1.03	13434	1.01	950	<i>2.63</i>	< 1	1.00	19036		
neos-1427261	686789	7200	63	15296	79	< 1	634996	<b>0.92</b>	7200	1.00	116	<i>1.82</i>	15348	1.00	357	<i>4.51</i>	< 1	1.00	11229		
neos-1429185	3395806	7200	32	17593	869	< 1	3236979	<b>0.95</b>	7200	1.00	33	1.04	16551	<b>0.94</b>	103	<b>0.12</b>	< 1	1.00	75685		
neos-1429212	1843	7200	720001	720001	7200	7200	3235	<i>1.76</i>	7200	1.00	720000	1.00	720000	1.00	7200	1.00	7200	1.00	493		
neos-1429461	5134809	7200	21	5314	107	< 1	5296876	1.03	7200	1.00	20	0.96	5312	1.00	320	<i>3.00</i>	< 1	1.00	56247		
neos-1430701	730149	423	14	453	2	< 1	543069	<b>0.74</b>	336	<b>0.79</b>	13	<b>0.88</b>	354	<b>0.78</b>	5	<i>2.14</i>	< 1	1.00	2126 $\checkmark$		
neos-1430811	788	7200	477701	719999	5130	11	687	<b>0.87</b>	7200	1.00	487276	1.02	719999	1.00	4137	<b>0.81</b>	11	0.98	399		
neos-1436709	2903018	7200	19	5600	137	< 1	2877043	0.99	7200	1.00	21	<i>1.06</i>	5601	1.00	2200	<i>16.02</i>	< 1	1.00	34354		
neos-1436713	481839	7200	46	16203	140	< 1	371260	<b>0.77</b>	7200	1.00	45	0.99	16201	1.00	40	<b>0.28</b>	< 1	1.00	5358		
neos-1437164	1	1	60	63	1	1	1	1.00	1	1.00	60	1.00	63	1.00	1	0.99	1	0.99	0		
neos-1439395	11803298	7200	16	4739	161	< 1	12521497	<i>1.06</i>	7200	1.00	16	1.00	4306	<b>0.91</b>	25	<b>0.15</b>	< 1	1.00	27757		
neos-1440225	3734	82	8218	8226	82	82	4476	<i>1.20</i>	105	<i>1.27</i>	10453	<i>1.27</i>	10456	<i>1.27</i>	105	<i>1.27</i>	105	<i>1.27</i>	66		
neos-1440447	74326	58	9	110	1	< 1	63921	<b>0.86</b>	52	<b>0.89</b>	9	1.01	101	<b>0.91</b>	1	<i>1.31</i>	< 1	1.00	580		
neos-1440457	3105583	7200	23	3027	1965	< 1	3163092	1.02	7200	1.00	23	1.01	3027	1.00	880	<b>0.45</b>	< 1	1.00	24005		
neos-1440460	6006292	7200	21	3020	2121	< 1	5974018	0.99	7200	1.00	20	0.98	3019	1.00	737	<b>0.35</b>	< 1	1.00	26334 $\checkmark$		
neos-1441553	6	3	225	226	3	2	1	<b>0.18</b>	1	<b>0.48</b>	108	<b>0.48</b>	110	<b>0.49</b>	1	<b>0.48</b>	1	<b>0.65</b>	59 $\checkmark$		
neos-1442119	2189513	7200	18	3974	307	< 1	2297826	<i>1.05</i>	7200	1.00	20	<i>1.14</i>	3975	1.00	1505	<i>4.89</i>	< 1	1.00	20642		

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Instance	default						confdiving													$\mathbf{C}$	$\mathbf{I}$
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$			
neos-1442657	2858252	7200	21	6944	96	< 1	2700168	<b>0.94</b>	7200	1.00	21	0.98	6942	1.00	947	<i>9.91</i>	< 1	1.00	64330		
neos-1445532	4644	7200	24607	93955	4198	< 1	4297	<b>0.93</b>	7200	1.00	32981	<i>1.34</i>	106818	<i>1.14</i>	5095	<i>1.21</i>	< 1	<i>1.29</i>	1432 $\checkmark$		
neos-1445738	65453	7200	103149	238544	4228	< 1	48652	<b>0.74</b>	7200	1.00	142941	<i>1.39</i>	262013	<i>1.10</i>	5720	<i>1.35</i>	< 1	<b>0.93</b>	701 $\checkmark$		
neos-1445743	156	50	2608	2681	47	< 1	156	1.00	50	1.00	2610	1.00	2684	1.00	47	1.00	< 1	<b>0.88</b>	0		
neos-1445755	170	53	2822	2894	49	< 1	171	1.00	53	0.99	2847	1.01	2918	1.01	49	1.00	< 1	<i>1.33</i>	1		
neos-1445765	148	52	2662	2754	39	< 1	148	1.00	52	1.01	2689	1.01	2780	1.01	39	1.01	< 1	<i>1.12</i>	12		
neos-1451294	21836	4730	122347	207542	2913	176	18051	<b>0.83</b>	4315	<b>0.91</b>	125664	1.03	197439	<b>0.95</b>	2064	<b>0.71</b>	131	<b>0.74</b>	1706		
neos-1456979	182212	6719	11492	50055	2391	62	129116	<b>0.71</b>	6410	<b>0.95</b>	12664	<i>1.10</i>	48524	0.97	2559	<i>1.07</i>	46	<b>0.75</b>	1865		
neos-1460246	2426992	7200	19	709	883	< 1	2453927	1.01	7200	1.00	23	<i>1.16</i>	719	1.01	1111	<i>1.26</i>	< 1	<i>1.24</i>	147001		
neos-1460265	200	6	101	103	6	1	228	<i>1.14</i>	6	<b>0.95</b>	73	<b>0.72</b>	75	<b>0.73</b>	6	<b>0.95</b>	1	<b>0.70</b>	32		
neos-1460543	20892	7200	12403	42150	4411	< 1	23806	<i>1.14</i>	7200	1.00	13499	<i>1.09</i>	44385	<i>1.05</i>	1751	<b>0.40</b>	< 1	<i>1.05</i>	580		
neos-1460641	638303	7200	125	330	3297	< 1	611593	0.96	7200	1.00	144	<i>1.15</i>	348	<i>1.06</i>	3461	<i>1.05</i>	< 1	1.02	21830		
neos-1461051	5013	48	4844	720000	7200	7200	3415	<b>0.68</b>	36	<b>0.74</b>	3571	<b>0.74</b>	720000	1.00	7200	1.00	7200	1.00	115		
neos-1464762	475870	7200	274	478	1099	2	513692	<i>1.08</i>	7200	1.00	292	<i>1.06</i>	494	1.03	3037	<i>2.76</i>	2	<i>1.16</i>	39927 $\checkmark$		
neos-1467067	12039087	7200	27	6951	951	< 1	12078230	1.00	7200	1.00	27	1.01	6950	1.00	1946	<i>2.05</i>	< 1	1.00	6756		
neos-1467371	451872	7200	1947	14339	1594	1	815347	<i>1.80</i>	7200	1.00	2390	<i>1.23</i>	12960	<b>0.90</b>	3463	<i>2.17</i>	1	1.02	25411 $\checkmark$		
neos-1467467	61226	7200	4328	17071	225	1	199795	<i>3.26</i>	7200	1.00	5798	<i>1.34</i>	17768	1.04	4138	<i>18.35</i>	1	1.00	20727		
neos-1480121	1029	10	151	694	9	< 1	273	<b>0.27</b>	15	<i>1.54</i>	168	<i>1.11</i>	1057	<i>1.52</i>	12	<i>1.27</i>	< 1	<b>0.86</b>	72 $\checkmark$		
neos-1489999	31	3	21	67	2	< 1	59	<i>1.90</i>	4	<i>1.17</i>	24	<i>1.13</i>	80	<i>1.19</i>	3	<i>1.34</i>	< 1	1.00	0 $\checkmark$		
neos-1516309	1	1	16	18	< 1	< 1	1	<i>1.17</i>	1	<i>1.08</i>	21	<i>1.31</i>	20	<i>1.10</i>	< 1	<i>1.25</i>	< 1	<i>1.08</i>	14 $\checkmark$		
neos-1582420	1099	47	1454	1499	46	13	1880	<i>1.71</i>	67	<i>1.45</i>	1920	<i>1.32</i>	2001	<i>1.34</i>	67	<i>1.43</i>	15	<i>1.23</i>	160		
neos-1593097	43753	7200	3507	113599	4513	30	53372	<i>1.22</i>	7200	1.00	2490	<b>0.71</b>	112740	0.99	3326	<b>0.74</b>	18	<b>0.62</b>	19243 $\checkmark$		
neos-1595230	1094153	5076	75	93553	24	< 1	1298264	<i>1.19</i>	7200	<i>1.42</i>	75	1.00	177974	<i>1.90</i>	7	<b>0.30</b>	< 1	<i>1.11</i>	2479		
neos-1597104	20	289	22227	22223	289	< 1	5	<b>0.26</b>	258	<b>0.89</b>	16127	<b>0.73</b>	16119	<b>0.73</b>	258	<b>0.89</b>	< 1	1.03	60 $\checkmark$		
neos-1599274	15	3	38	41	2	< 1	7	<b>0.48</b>	1	<b>0.50</b>	31	<b>0.81</b>	32	<b>0.79</b>	1	<b>0.48</b>	< 1	0.98	110 $\checkmark$		
neos-1601936	10958	5705	466880	466878	4302	615	16363	<i>1.49</i>	6081	<i>1.07</i>	453103	0.97	453113	0.97	5706	<i>1.33</i>	438	<b>0.71</b>	3388		
neos-1603512	212	4	255	316	3	3	14	<b>0.07</b>	2	<b>0.55</b>	195	<b>0.76</b>	203	<b>0.64</b>	2	<b>0.77</b>	2	<b>0.77</b>	121		
neos-1603518	2225	21	1300	1623	13	13	830	<b>0.37</b>	14	<b>0.65</b>	923	<b>0.71</b>	1128	<b>0.69</b>	9	<b>0.71</b>	9	<b>0.71</b>	177		
neos-1603965	44657	7200	910	1992	2765	1	48950	<i>1.10</i>	7200	1.00	987	<i>1.08</i>	2078	1.04	1105	<b>0.40</b>	1	1.02	492 $\checkmark$		
neos-1605061	715	7200	719528	719788	7156	7156	1177	<i>1.65</i>	7200	1.00	713674	0.99	717213	1.00	6757	<b>0.94</b>	6757	<b>0.94</b>	630		

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Instance	default						confdiving													$\mathbf{C}$	$\mathbf{I}$
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$			
neos-1605075	3213	7200	664309	667362	5218	1122	4338	<i>1.35</i>	7200	1.00	598649	<b>0.90</b>	602697	<b>0.90</b>	6036	<i>1.16</i>	874	<b>0.78</b>	1105		
neos-1616732	2971128	5547	384	26113	452	< 1	2992570	1.01	5559	1.00	413	<i>1.08</i>	26238	1.00	507	<i>1.12</i>	< 1	1.00	203		
neos-1620770	1617989	7200	15	122579	< 1	< 1	1494478	<b>0.92</b>	7200	1.00	17	<i>1.11</i>	146959	<i>1.20</i>	< 1	1.02	< 1	1.03	335342		
neos-1620807	1851610	1440	0	19867	55	< 1	1523106	<b>0.82</b>	1241	<b>0.86</b>	0	<b>0.00</b>	21468	<i>1.08</i>	283	<i>5.18</i>	< 1	1.00	101718		
neos-1622252	518004	7200	11	426677	235	< 1	467819	<b>0.90</b>	7200	1.00	11	0.99	458033	<i>1.07</i>	< 1	<b>0.00</b>	< 1	1.02	405770		
neos-430149	26710	30	335	2530	14	1	23513	<b>0.88</b>	26	<b>0.89</b>	331	0.99	2244	<b>0.89</b>	8	<b>0.61</b>	1	<i>1.21</i>	250 $\checkmark$		
neos-476283	517	177	1454	3932	148	14	671	<i>1.30</i>	181	1.02	1454	1.00	3933	1.00	164	<i>1.11</i>	14	1.01	11249 $\checkmark$		
neos-480878	9355	41	24	102	24	< 1	10594	<i>1.13</i>	45	<i>1.11</i>	25	1.02	109	<i>1.07</i>	29	<i>1.21</i>	< 1	1.03	124		
neos-494568	10	26	292	331	26	< 1	6	<b>0.59</b>	31	<i>1.20</i>	271	<b>0.93</b>	308	<b>0.93</b>	31	<i>1.20</i>	< 1	<i>1.05</i>	45 $\checkmark$		
neos-495307	163476	7200	19	8904	2416	< 1	164420	1.01	7200	1.00	17	<b>0.88</b>	8901	1.00	1729	<b>0.72</b>	< 1	<b>0.86</b>	83		
neos-498623	11	39	1589	1601	39	2	48	<i>4.35</i>	59	<i>1.52</i>	1813	<i>1.14</i>	1904	<i>1.19</i>	59	<i>1.52</i>	2	1.01	76 $\checkmark$		
neos-501453	1	1	0	2	< 1	< 1	1	1.00	1	1.00	0	<i>1.21</i>	3	<i>1.21</i>	< 1	<i>1.21</i>	< 1	<i>1.21</i>	0		
neos-501474	135	1	0	2	< 1	< 1	143	<i>1.06</i>	1	1.03	1	<i>311.28</i>	2	<b>0.85</b>	< 1	<b>0.44</b>	< 1	<b>0.67</b>	101 $\checkmark$		
neos-503737	14639	439	3365	3380	439	< 1	7034	<b>0.48</b>	269	<b>0.61</b>	2117	<b>0.63</b>	2134	<b>0.63</b>	269	<b>0.61</b>	< 1	<i>1.07</i>	454		
neos-504674	7712	57	1407	2377	44	< 1	8019	1.04	58	1.02	1150	<b>0.82</b>	2228	<b>0.94</b>	31	<b>0.71</b>	< 1	<b>0.95</b>	119 $\checkmark$		
neos-504815	2729	20	500	854	13	< 1	2718	1.00	21	<i>1.07</i>	511	1.02	888	1.04	15	<i>1.21</i>	< 1	<i>1.17</i>	72 $\checkmark$		
neos-506422	4763	52	5230	5232	52	< 1	4707	0.99	51	0.98	5123	0.98	5123	0.98	51	0.98	< 1	1.00	110 $\checkmark$		
neos-506428	420	4300	269318	351030	3836	2376	452	<i>1.07</i>	4623	<i>1.08</i>	282185	<i>1.05</i>	367151	<i>1.05</i>	4416	<i>1.15</i>	2417	1.02	76		
neos-512201	3123	31	1111	1599	24	< 1	2791	<b>0.89</b>	28	<b>0.88</b>	964	<b>0.87</b>	1434	<b>0.90</b>	20	<b>0.82</b>	< 1	<b>0.85</b>	64 $\checkmark$		
neos-522351	1	2	101	103	2	< 1	1	1.00	2	1.01	102	1.02	105	1.02	2	1.02	< 1	<b>0.86</b>	165 $\checkmark$		
neos-525149	15	5	205	206	5	1	1	<b>0.09</b>	2	<b>0.43</b>	176	<b>0.86</b>	176	<b>0.85</b>	2	<b>0.40</b>	1	1.00	14 $\checkmark$		
neos-530627	1	1	0	0	< 1	< 1	1	1.00	1	1.00	0	<b>0.00</b>	< 1	<i>51.00</i>	< 1	1.00	< 1	1.00	0		
neos-538867	37180	104	640	5230	70	< 1	29021	<b>0.78</b>	83	<b>0.80</b>	541	<b>0.85</b>	4164	<b>0.80</b>	58	<b>0.83</b>	< 1	<b>0.86</b>	505 $\checkmark$		
neos-538916	21196	76	844	3909	39	< 1	22941	<i>1.08</i>	83	<i>1.09</i>	985	<i>1.17</i>	4295	<i>1.10</i>	44	<i>1.14</i>	< 1	<b>0.72</b>	548		
neos-544324	345308	4981	724	34711	1025	5	17804	<b>0.05</b>	368	<b>0.07</b>	645	<b>0.89</b>	3223	<b>0.09</b>	29	<b>0.03</b>	5	0.99	196		
neos-547911	357	27	343	437	27	1	474	<i>1.33</i>	32	<i>1.18</i>	379	<i>1.11</i>	491	<i>1.12</i>	32	<i>1.18</i>	1	0.99	37		
neos-548047	44815	7200	16176	332218	1288	< 1	37546	<b>0.84</b>	7200	1.00	27030	<i>1.67</i>	330091	0.99	2071	<i>1.61</i>	< 1	1.00	629		
neos-548251	1314128	7200	48222	459108	1388	20	1307038	<b>0.99</b>	7200	1.00	61116	<i>1.27</i>	465060	1.01	3810	<i>2.75</i>	14	<b>0.72</b>	112424		
neos-551991	1173	225	1789	6603	191	< 1	1186	1.01	232	1.03	2042	<i>1.14</i>	6906	<i>1.05</i>	192	1.01	< 1	<i>1.06</i>	261 $\checkmark$		
neos-555001	57	2	132	134	2	1	4	<b>0.08</b>	1	<b>0.71</b>	120	<b>0.91</b>	121	<b>0.90</b>	1	<b>0.71</b>	1	<b>0.90</b>	17 $\checkmark$		

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Instance	default						confdiving												$\mathbf{C}$	$\mathbf{I}$
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$		
neos-555298	1061	59	1046	1055	59	< 1	1394	<i>1.31</i>	58	0.98	1190	<i>1.14</i>	1199	<i>1.14</i>	58	0.98	< 1	<i>1.07</i>	111	$\checkmark$
neos-555343	662286	4120	6064	6140	2662	< 1	389886	<b>0.59</b>	2908	<b>0.71</b>	4352	<b>0.72</b>	4431	<b>0.72</b>	2013	<b>0.76</b>	< 1	0.99	4279	
neos-555424	465993	2660	5090	5096	2295	< 1	154690	<b>0.33</b>	1216	<b>0.46</b>	5055	0.99	5062	0.99	1216	<b>0.53</b>	< 1	0.97	2892	
neos-555694	15	5	149	152	5	< 1	3	<b>0.22</b>	4	<b>0.67</b>	61	<b>0.41</b>	65	<b>0.43</b>	4	<b>0.67</b>	< 1	1.00	126	$\checkmark$
neos-555771	12	4	107	113	4	< 1	3	<b>0.29</b>	3	<b>0.70</b>	64	<b>0.60</b>	73	<b>0.65</b>	3	<b>0.70</b>	< 1	0.99	285	$\checkmark$
neos-555884	183751	7200	173714	223181	5110	1420	168077	<b>0.91</b>	7200	1.00	129827	<b>0.75</b>	184749	<b>0.83</b>	5973	<i>1.17</i>	1006	<b>0.71</b>	31092	$\checkmark$
neos-555927	2009877	7200	5251	28264	1186	36	2016037	1.00	7200	1.00	7697	<i>1.47</i>	29230	1.03	1454	<i>1.23</i>	39	<i>1.07</i>	31286	$\checkmark$
neos-565672	52	6798	347333	359297	6307	5	73	<i>1.40</i>	6663	0.98	335261	0.97	347131	0.97	6599	<i>1.05</i>	5	0.96	15154	
neos-565815	3	16	140	418	5	1	4	<i>1.22</i>	16	0.98	139	0.99	412	0.99	4	<b>0.76</b>	1	1.00	70	
neos-570431	526	15	82	618	4	< 1	624	<i>1.19</i>	19	<i>1.23</i>	118	<i>1.45</i>	757	<i>1.23</i>	8	<i>1.87</i>	< 1	<b>0.90</b>	19	
neos-574665	7790654	7200	151	313	3376	1	9524835	<i>1.22</i>	7200	1.00	137	<b>0.91</b>	468	<i>1.49</i>	3535	<i>1.05</i>	1	<b>0.91</b>	19848	$\checkmark$
neos-578379	2	226	22617	22627	226	226	1	<b>0.67</b>	199	<b>0.88</b>	19933	<b>0.88</b>	19921	<b>0.88</b>	199	<b>0.88</b>	199	<b>0.88</b>	25	$\checkmark$
neos-582605	826431	7200	802	720001	2219	8	963152	<i>1.17</i>	7200	1.00	233	<b>0.29</b>	720003	1.00	2028	<b>0.91</b>	2	<b>0.29</b>	71486	
neos-583731	38	13	1277	1276	13	13	9	<b>0.25</b>	6	<b>0.47</b>	593	<b>0.46</b>	595	<b>0.47</b>	6	<b>0.47</b>	6	<b>0.47</b>	52	$\checkmark$
neos-584146	1820616	7200	0	720001	4119	< 1	2240222	<i>1.23</i>	7200	1.00	203584	<i>inf</i>	720002	1.00	3760	<b>0.91</b>	< 1	<b>0.70</b>	20182	
neos-584851	395	9	77	296	2	< 1	192	<b>0.48</b>	9	0.98	116	<i>1.51</i>	322	<i>1.09</i>	4	<i>2.05</i>	< 1	0.98	50	$\checkmark$
neos-584866	376079	7200	16197	583807	2379	3	303003	<b>0.81</b>	7200	1.00	27184	<i>1.68</i>	588641	1.01	3449	<i>1.45</i>	3	1.02	423	
neos-585192	819	25	396	591	23	3	749	<b>0.91</b>	24	<b>0.94</b>	363	<b>0.92</b>	551	<b>0.93</b>	21	<b>0.91</b>	3	1.00	142	
neos-585467	62	9	203	267	8	1	106	<i>1.71</i>	11	<i>1.24</i>	209	1.03	291	<i>1.09</i>	9	<i>1.16</i>	1	0.99	54	$\checkmark$
neos-593853	54583	119	243	241	108	1	85034	<i>1.56</i>	193	<i>1.62</i>	422	<i>1.74</i>	422	<i>1.75</i>	181	<i>1.68</i>	1	<b>0.83</b>	436	$\checkmark$
neos-595904	5	26	1223	1224	19	12	4	<b>0.83</b>	26	1.00	1232	1.01	1235	1.01	16	<b>0.87</b>	12	1.01	2004	
neos-595905	4	6	282	282	3	3	4	<i>1.10</i>	7	<i>1.17</i>	253	<b>0.90</b>	255	<b>0.90</b>	3	<b>0.95</b>	3	<b>0.89</b>	287	$\checkmark$
neos-595925	445	22	387	411	16	4	482	<i>1.08</i>	19	<b>0.87</b>	368	<b>0.95</b>	385	<b>0.94</b>	13	<b>0.82</b>	4	<b>0.95</b>	328	
neos-598183	10	8	128	134	8	1	6	<b>0.63</b>	11	<i>1.39</i>	117	<b>0.92</b>	125	<b>0.93</b>	11	<i>1.31</i>	1	0.99	636	$\checkmark$
neos-603073	641179	2688	291	11236	735	1	814475	<i>1.27</i>	3632	<i>1.35</i>	299	1.03	17766	<i>1.58</i>	420	<b>0.57</b>	1	1.00	2073	
neos-611135	184810	7200	33749	38760	4959	2	173581	<b>0.94</b>	7200	1.00	24781	<b>0.73</b>	29806	<b>0.77</b>	6190	<i>1.25</i>	3	1.02	824	$\checkmark$
neos-611838	1020	28	24	101	19	< 1	1019	1.00	28	1.00	26	<i>1.08</i>	102	1.01	18	<b>0.92</b>	< 1	1.00	3	
neos-612125	385	23	15	96	17	< 1	424	<i>1.10</i>	25	<i>1.09</i>	16	1.03	102	<i>1.06</i>	15	<b>0.88</b>	< 1	<b>0.94</b>	3	
neos-612143	808	26	22	98	22	< 1	649	<b>0.80</b>	28	<i>1.09</i>	22	1.02	106	<i>1.08</i>	24	<i>1.11</i>	< 1	0.99	4	$\checkmark$
neos-612162	897	27	23	102	22	< 1	867	0.97	28	1.04	27	<i>1.16</i>	109	<i>1.07</i>	23	1.04	< 1	1.02	5	

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Instance	default						confdiving													$\mathbf{C}$	$\mathbf{I}$
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$			
neos-619167	141	7200	305500	426710	1167	< 1	143	1.01	7200	1.00	309618	1.01	430193	1.01	1408	<i>1.21</i>	< 1	0.97	19		
neos-631164	245619	7200	9257	160888	5590	< 1	274313	<i>1.12</i>	7200	1.00	8416	<b>0.91</b>	154058	0.96	4628	<b>0.83</b>	< 1	0.99	669 $\checkmark$		
neos-631517	281712	7200	6475	137114	4413	< 1	264265	<b>0.94</b>	7200	1.00	6581	1.02	137847	1.01	4993	<i>1.13</i>	< 1	<b>0.95</b>	1174		
neos-631694	880754	5594	1977	35421	20	20	855719	<b>0.97</b>	6267	<i>1.12</i>	2710	<i>1.37</i>	40151	<i>1.13</i>	27	<i>1.37</i>	27	<i>1.37</i>	2056 $\checkmark$		
neos-631709	447	7200	16941	79917	4963	17	831	<i>1.86</i>	7200	1.00	19976	<i>1.18</i>	82462	1.03	3378	<b>0.68</b>	19	<i>1.12</i>	13		
neos-631710	3	7200	47192	189154	1113	82	2	<b>0.63</b>	7200	1.00	48026	1.02	191625	1.01	1229	<i>1.10</i>	84	1.03	21		
neos-631784	107426	6127	1642	38819	61	15	190576	<i>1.77</i>	7200	<i>1.18</i>	1670	1.02	45290	<i>1.17</i>	62	1.03	16	1.02	7167		
neos-632335	133	10	141	1003	10	< 1	133	1.00	10	1.00	143	1.01	1001	1.00	10	1.00	< 1	1.02	0		
neos-633273	252	13	180	1336	13	< 1	252	1.00	13	0.99	178	0.99	1329	0.99	13	0.99	< 1	0.97	0		
neos-655508	1	1	27	27	< 1	< 1	1	1.00	1	1.00	28	<i>1.06</i>	27	1.01	< 1	1.02	< 1	1.02	0		
neos-662469	52248	7200	38466	38610	6245	1	46198	<b>0.88</b>	7200	1.00	22272	<b>0.58</b>	22402	<b>0.58</b>	5037	<b>0.81</b>	1	1.00	14034		
neos-686190	8949	127	1817	2923	114	4	6792	<b>0.76</b>	111	<b>0.87</b>	1579	<b>0.87</b>	2654	<b>0.91</b>	91	<b>0.79</b>	< 1	<b>0.04</b>	650		
neos-691058	6408	7200	6286	44306	3950	3	4869	<b>0.76</b>	7200	1.00	4588	<b>0.73</b>	46937	<i>1.06</i>	3834	0.97	3	1.00	737		
neos-691073	12911	7200	4531	44178	4189	25	10095	<b>0.78</b>	7200	1.00	6617	<i>1.46</i>	46049	1.04	4096	0.98	44	<i>1.74</i>	1368		
neos-693347	50294	5034	89808	89790	4422	814	33698	<b>0.67</b>	3578	<b>0.71</b>	34642	<b>0.39</b>	34640	<b>0.39</b>	3578	<b>0.81</b>	304	<b>0.37</b>	10124		
neos-702280	5798	7200	55845	303171	1072	< 1	5716	0.99	7200	1.00	55839	1.00	303610	1.00	5	<b>0.00</b>	< 1	1.01	3		
neos-709469	509	1	72	71	1	1	893	<i>1.76</i>	1	<i>1.15</i>	88	<i>1.23</i>	88	<i>1.25</i>	1	<i>1.25</i>	1	<i>1.25</i>	81		
neos-717614	1458306	1207	116	117	14	1	14426	<b>0.01</b>	54	<b>0.04</b>	115	0.99	118	1.01	50	<i>3.67</i>	1	0.99	72		
neos-738098	775	7200	720075	720075	7200	7200	1402	<i>1.81</i>	7200	1.00	720001	1.00	720001	1.00	7200	1.00	7200	1.00	201		
neos-775946	26	12	455	462	12	1	8	<b>0.31</b>	12	1.01	431	<b>0.95</b>	439	<b>0.95</b>	12	1.02	1	1.03	232 $\checkmark$		
neos-780889	2	90	6057	6059	90	60	2	1.00	104	<i>1.15</i>	6310	1.04	6307	1.04	104	<i>1.15</i>	61	1.02	11599 $\checkmark$		
neos-785899	37	4	229	234	4	2	36	0.96	4	0.99	268	<i>1.17</i>	272	<i>1.16</i>	4	0.99	3	<i>1.17</i>	34		
neos-785912	304	64	6394	720000	7200	7200	206	<b>0.68</b>	49	<b>0.76</b>	4889	<b>0.76</b>	720000	1.00	7200	1.00	7200	1.00	89		
neos-785914	8	6	645	647	6	6	21	<i>2.48</i>	7	1.01	652	1.01	652	1.01	7	1.01	7	1.01	28		
neos-787933	1	2	153	157	2	< 1	1	1.00	2	0.99	153	1.00	154	0.99	2	0.99	< 1	0.98	0		
neos-791021	92	548	26989	31244	461	206	65	<b>0.71</b>	450	<b>0.82</b>	19009	<b>0.70</b>	20625	<b>0.66</b>	449	0.97	128	<b>0.62</b>	70		
neos-796608	1104043	258	2	2	< 1	< 1	932453	<b>0.84</b>	214	<b>0.83</b>	3	<i>1.10</i>	2	<i>1.12</i>	2	<i>36.85</i>	< 1	1.00	151		
neos-799838	6	97	1114	1346	97	8	6	1.00	100	1.03	1164	<i>1.05</i>	1446	<i>1.07</i>	100	1.03	8	0.99	21		
neos-801834	135	31	64	202	6	< 1	258	<i>1.91</i>	38	<i>1.22</i>	103	<i>1.62</i>	273	<i>1.35</i>	16	<i>2.56</i>	< 1	<b>0.90</b>	6		
neos-803219	11685	38	76	460	23	< 1	12658	<i>1.08</i>	38	0.99	78	1.02	361	<b>0.79</b>	17	<b>0.74</b>	< 1	0.96	452		

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Instance	default						confdiving												$\mathbf{C}$	$\mathbf{I}$
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$		
neos-803220	40810	89	93	758	43	< 1	43764	<i>1.07</i>	95	<i>1.06</i>	104	<i>1.12</i>	866	<i>1.14</i>	48	<i>1.12</i>	< 1	<i>1.10</i>	1463	$\checkmark$
neos-806323	6810	39	575	870	14	4	5981	<b>0.88</b>	35	<b>0.91</b>	535	<b>0.93</b>	810	<b>0.93</b>	13	<b>0.93</b>	4	<b>0.95</b>	214	$\checkmark$
neos-807454	1	3	258	720000	7200	7200	1	1.00	3	<i>1.12</i>	290	<i>1.12</i>	720000	1.00	7200	1.00	7200	1.00	9	
neos-807639	2612	22	157	322	4	2	2463	<b>0.94</b>	24	<i>1.08</i>	75	<b>0.48</b>	254	<b>0.79</b>	4	<b>0.92</b>	1	<b>0.45</b>	641	$\checkmark$
neos-807705	3369	32	333	560	14	3	3635	<i>1.08</i>	35	<i>1.12</i>	109	<b>0.33</b>	449	<b>0.80</b>	18	<i>1.29</i>	< 1	<b>0.14</b>	231	$\checkmark$
neos-808072	263	31	2113	2387	29	20	170	<b>0.65</b>	28	<b>0.89</b>	2272	<i>1.08</i>	2312	0.97	27	<b>0.91</b>	22	<i>1.10</i>	36	
neos-808214	5105	54	1612	4362	16	16	4687	<b>0.92</b>	54	1.01	2005	<i>1.24</i>	4832	<i>1.11</i>	23	<i>1.46</i>	20	<i>1.25</i>	1014	
neos-810286	307	157	9926	9935	157	97	987	<i>3.21</i>	323	<i>2.06</i>	27206	<i>2.74</i>	27210	<i>2.74</i>	323	<i>2.06</i>	269	<i>2.78</i>	418	
neos-810326	1653	74	1516	1591	72	13	955	<b>0.58</b>	50	<b>0.68</b>	2211	<i>1.46</i>	2255	<i>1.42</i>	47	<b>0.65</b>	21	<i>1.55</i>	184	
neos-820146	1955429	7200	720000	720000	7200	7200	1985580	1.02	7200	1.00	720000	1.00	720000	1.00	7200	1.00	7200	1.00	54916	
neos-820157	1343991	7200	720002	720002	7200	7200	1502156	<i>1.12</i>	7200	1.00	720001	1.00	720001	1.00	7200	1.00	7200	1.00	46349	
neos-820879	616	59	1531	1578	56	14	792	<i>1.29</i>	71	<i>1.20</i>	2008	<i>1.31</i>	2056	<i>1.30</i>	68	<i>1.22</i>	18	<i>1.30</i>	328	
neos-824661	81	1720	26267	26660	1720	2	26	<b>0.32</b>	947	<b>0.55</b>	19671	<b>0.75</b>	20061	<b>0.75</b>	947	<b>0.55</b>	2	0.98	69	$\checkmark$
neos-824695	53	461	6529	6660	461	1	51	<b>0.95</b>	462	1.00	5858	<b>0.90</b>	5990	<b>0.90</b>	462	1.00	1	0.99	47	$\checkmark$
neos-825075	6	2	181	180	2	1	5	<b>0.76</b>	3	<i>1.40</i>	191	<i>1.06</i>	192	<i>1.06</i>	3	<i>1.41</i>	1	<i>1.08</i>	77	$\checkmark$
neos-826224	1	20	324	605	20	1	1	1.00	20	1.01	319	0.98	602	0.99	20	1.01	1	1.02	2	
neos-826250	13	109	1675	1693	109	< 1	29	<i>2.23</i>	155	<i>1.41</i>	1624	0.97	1643	0.97	154	<i>1.41</i>	< 1	0.96	20	
neos-826650	29781	7200	413829	424387	4547	4036	38867	<i>1.31</i>	7200	1.00	219879	<b>0.53</b>	237116	<b>0.56</b>	3425	<b>0.75</b>	2024	<b>0.50</b>	3212	
neos-826694	65	460	3088	3226	460	1	76	<i>1.17</i>	487	<i>1.06</i>	4247	<i>1.38</i>	4384	<i>1.36</i>	487	<i>1.06</i>	1	0.97	40	
neos-826812	5	127	1767	1979	127	< 1	4	<b>0.87</b>	102	<b>0.80</b>	1582	<b>0.90</b>	1793	<b>0.91</b>	102	<b>0.80</b>	< 1	1.01	63	
neos-826841	205677	7200	2636	27365	2430	19	209253	1.02	7200	1.00	5005	<i>1.90</i>	29655	<i>1.08</i>	1542	<b>0.63</b>	47	<i>2.51</i>	12812	
neos-827015	404	1678	31092	39044	1023	3	232	<b>0.58</b>	1146	<b>0.68</b>	21900	<b>0.70</b>	28068	<b>0.72</b>	792	<b>0.77</b>	3	1.00	713	$\checkmark$
neos-827175	2	29	156	615	29	1	2	<i>1.30</i>	28	0.96	144	<b>0.93</b>	598	0.97	28	0.96	1	<b>0.92</b>	0	
neos-829552	294	328	13241	14453	248	1	285	0.97	355	<i>1.08</i>	9318	<b>0.70</b>	11162	<b>0.77</b>	285	<i>1.15</i>	1	0.97	312	$\checkmark$
neos-830439	1	1	10	12	< 1	< 1	1	1.00	1	1.00	12	<i>1.17</i>	13	<i>1.08</i>	< 1	<i>1.07</i>	< 1	<i>1.07</i>	0	
neos-831188	4128	478	6343	15459	76	63	3415	<b>0.83</b>	419	<b>0.88</b>	7329	<i>1.16</i>	15188	0.98	93	<i>1.22</i>	72	<i>1.15</i>	492	
neos-839838	6952	7200	7735	620861	2035	1	6477	<b>0.93</b>	7200	1.00	6624	<b>0.86</b>	621525	1.00	862	<b>0.42</b>	1	1.00	132	
neos-839859	3189	56	175	328	42	< 1	17509	<i>5.49</i>	308	<i>5.51</i>	303	<i>1.74</i>	920	<i>2.80</i>	102	<i>2.44</i>	< 1	1.04	150	$\checkmark$
neos-839894	368	7200	45762	255078	700	24	491	<i>1.34</i>	7200	1.00	56129	<i>1.23</i>	261549	1.03	3144	<i>4.49</i>	24	1.02	116	$\checkmark$
neos-841664	80864	7200	2120	112920	38	< 1	84658	<i>1.05</i>	7200	1.00	1557	<b>0.73</b>	100971	<b>0.89</b>	1115	<i>29.30</i>	< 1	<b>0.93</b>	2101	$\checkmark$

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**Table 6:** Detailed computational results on CORAL test set. The table shows the absolute and relative numbers of nodes ( $\mathbf{N}$ ,  $\mathbf{N}_Q$ ), solving time ( $\mathbf{T}$ ,  $\mathbf{T}_Q$ ), primal integral ( $\mathbf{PI}$ ,  $\mathbf{PI}_Q$ ), primal-dual integral ( $\mathbf{PDI}$ ,  $\mathbf{PDI}_Q$ ), time to best ( $\mathbf{TtB}$ ,  $\mathbf{TtB}_Q$ ) and first solution ( $\mathbf{TtF}$ ,  $\mathbf{TtF}_Q$ ), and number of conflicts found by conflict diving ( $\mathbf{C}$ ). The right-most column ( $\mathbf{I}$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving													$\mathbf{I}$
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$	$\mathbf{C}$	
neos-847302	258494	7200	2257	717454	2379	4	264049	1.02	7200	1.00	4044	<i>1.79</i>	718277	1.00	1703	<b>0.72</b>	5	1.02	18970	
neos-848150	89	16	1595	1594	16	16	26	<b>0.29</b>	16	1.00	1590	1.00	1590	1.00	16	1.00	16	1.00	59	
neos-848198	1435	7200	41678	85297	2715	< 1	1623	<i>1.13</i>	7200	1.00	44429	<i>1.07</i>	87830	1.03	4468	<i>1.65</i>	< 1	1.01	52	
neos-848589	182	7200	173325	238789	2374	< 1	182	1.00	7200	1.00	173261	1.00	238759	1.00	2335	0.98	51	1.01	0	
neos-848845	60038	1102	110217	110217	1102	1102	32154	<b>0.54</b>	705	<b>0.64</b>	70533	<b>0.64</b>	70536	<b>0.64</b>	705	<b>0.64</b>	705	<b>0.64</b>	547	
neos-849702	19129	457	45692	45680	457	457	24138	<i>1.26</i>	554	<i>1.21</i>	55383	<i>1.21</i>	55392	<i>1.21</i>	554	<i>1.21</i>	554	<i>1.21</i>	453	
neos-850681	97	21	323	447	21	< 1	62	<b>0.65</b>	22	<i>1.07</i>	438	<i>1.36</i>	517	<i>1.16</i>	22	<i>1.07</i>	< 1	0.98	56	$\checkmark$
neos-856059	169468	3590	1402	1841	2474	< 1	164037	0.97	3400	<b>0.95</b>	1303	<b>0.93</b>	1743	<b>0.95</b>	3400	<i>1.37</i>	< 1	<i>1.11</i>	592	
neos-859770	1	176	17636	720000	7200	7200	1	1.00	175	0.99	17505	0.99	720000	1.00	7200	1.00	7200	1.00	6	
neos-860244	2	6	214	251	6	2	1	<b>0.73</b>	6	1.00	207	0.97	245	0.98	5	0.96	2	0.98	74	$\checkmark$
neos-860300	4	22	635	712	15	4	3	<b>0.90</b>	24	<i>1.10</i>	776	<i>1.22</i>	868	<i>1.22</i>	17	<i>1.18</i>	4	1.02	180	$\checkmark$
neos-862348	61	11	192	218	7	< 1	141	<i>2.33</i>	14	<i>1.35</i>	279	<i>1.45</i>	315	<i>1.44</i>	13	<i>1.72</i>	< 1	0.96	53	$\checkmark$
neos-863472	259721	272	64	979	61	1	246129	<b>0.95</b>	265	0.97	39	<b>0.61</b>	622	<b>0.64</b>	109	<i>1.77</i>	< 1	<b>0.59</b>	2551	$\checkmark$
neos-872648	98	7200	67053	358931	1990	24	97	0.99	7200	1.00	68085	1.02	358790	1.00	326	<b>0.16</b>	24	1.00	3	
neos-873061	2276	7200	44207	88161	3619	23	194	<b>0.09</b>	7200	1.00	42494	0.96	88947	1.01	4801	<i>1.33</i>	23	1.00	4	
neos-876808	663	7200	393063	560738	4838	8	364	<b>0.55</b>	7200	1.00	325446	<b>0.83</b>	501576	<b>0.89</b>	5524	<i>1.14</i>	8	0.99	36	
neos-880324	12	1	92	94	1	1	7	<b>0.57</b>	1	<b>0.92</b>	77	<b>0.84</b>	77	<b>0.82</b>	1	<b>0.81</b>	1	<b>0.81</b>	191	$\checkmark$
neos-881765	12	2	152	152	2	2	18	<i>1.49</i>	2	<i>1.25</i>	195	<i>1.29</i>	195	<i>1.28</i>	2	<i>1.28</i>	2	<i>1.28</i>	44	
neos-885086	371	6549	12278	12361	2980	< 1	359	0.97	6557	1.00	12036	0.98	12113	0.98	2738	<b>0.92</b>	< 1	<i>1.06</i>	0	
neos-885524	1112	121	752	754	121	7	3580	<i>3.22</i>	925	<i>7.64</i>	2944	<i>3.91</i>	2944	<i>3.90</i>	925	<i>7.64</i>	29	<i>3.86</i>	197	$\checkmark$
neos-886822	243671	2571	2247	181007	1672	< 1	374800	<i>1.54</i>	3712	<i>1.44</i>	3329	<i>1.48</i>	252324	<i>1.39</i>	2633	<i>1.57</i>	< 1	1.00	973	
neos-892255	507	59	10	1163	< 1	< 1	633	<i>1.25</i>	84	<i>1.43</i>	10	1.00	1582	<i>1.36</i>	< 1	0.96	< 1	0.96	104	
neos-905856	19767	252	12210	12239	252	83	24321	<i>1.23</i>	279	<i>1.11</i>	14144	<i>1.16</i>	14331	<i>1.17</i>	279	<i>1.11</i>	73	<b>0.88</b>	1651	
neos-906865	17823	134	58	1377	28	< 1	17481	0.98	126	<b>0.94</b>	56	0.97	1357	0.99	19	<b>0.67</b>	< 1	<i>1.07</i>	138	
neos-911880	751773	7200	2234	11810	1068	< 1	1163271	<i>1.55</i>	7200	1.00	2036	<b>0.91</b>	11867	1.00	1033	0.97	< 1	<b>0.92</b>	1287	$\checkmark$
neos-911970	1536793	6035	1683	6976	1815	< 1	1358093	<b>0.88</b>	6951	<i>1.15</i>	1134	<b>0.67</b>	5715	<b>0.82</b>	1749	0.96	< 1	<i>1.23</i>	1147	$\checkmark$
neos-912015	147	10	631	632	10	5	700	<i>4.75</i>	16	<i>1.57</i>	963	<i>1.53</i>	963	<i>1.52</i>	16	<i>1.57</i>	7	<i>1.46</i>	141	
neos-912023	186	11	780	797	10	7	75	<b>0.40</b>	10	<b>0.93</b>	840	<i>1.08</i>	846	<i>1.06</i>	10	1.01	8	<i>1.12</i>	80	
neos-913984	1	2	217	217	2	2	1	1.00	2	<i>1.07</i>	235	<i>1.08</i>	234	<i>1.08</i>	2	<i>1.08</i>	2	<i>1.08</i>	0	
neos-914441	7	20	739	992	20	< 1	37	<i>5.12</i>	28	<i>1.42</i>	1170	<i>1.58</i>	1698	<i>1.71</i>	28	<i>1.42</i>	< 1	1.00	67	$\checkmark$

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Instance	default						confdiving											$\mathbf{C}$	$\mathbf{I}$
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$		
neos-916173	15115	162	2451	4732	142	12	19667	<i>1.30</i>	194	<i>1.20</i>	3009	<i>1.23</i>	5641	<i>1.19</i>	182	<i>1.27</i>	15	<i>1.22</i>	95
neos-916792	119285	971	2478	7968	290	13	147959	<i>1.24</i>	1193	<i>1.23</i>	2588	1.04	10161	<i>1.28</i>	392	<i>1.35</i>	13	0.98	99
neos-930752	1498	7200	33802	71641	5030	4	1486	0.99	7200	1.00	35480	<i>1.05</i>	74455	1.04	3103	<b>0.62</b>	5	<i>1.17</i>	178
neos-931517	1509	7200	73830	163780	2571	4	1517	1.01	7200	1.00	75671	1.02	168806	1.03	2065	<b>0.80</b>	3	<b>0.89</b>	417
neos-931538	78	387	3075	3614	301	3	5	<b>0.07</b>	116	<b>0.30</b>	2187	<b>0.71</b>	2542	<b>0.70</b>	116	<b>0.38</b>	3	0.99	105 $\checkmark$
neos-932721	11	29	199	200	29	< 1	11	0.98	29	0.99	195	0.98	197	0.99	29	0.99	< 1	0.96	2
neos-932816	578	7200	155970	421024	5846	< 1	543	<b>0.94</b>	7200	1.00	143847	<b>0.92</b>	420054	1.00	6360	<i>1.09</i>	< 1	1.03	67
neos-933364	55902	129	82	100	43	< 1	52820	<b>0.94</b>	119	<b>0.92</b>	84	1.02	102	1.02	40	<b>0.92</b>	< 1	<i>1.11</i>	230
neos-933550	1	1	30	29	< 1	< 1	1	1.00	1	1.00	28	<b>0.94</b>	29	0.98	< 1	0.98	< 1	0.98	0
neos-933562	26991	7200	26451	720001	1678	< 1	26595	0.99	7200	1.00	19007	<b>0.72</b>	720000	1.00	1166	<b>0.69</b>	< 1	1.03	13429
neos-933638	327	3609	88808	88810	3566	< 1	417	<i>1.28</i>	3569	0.99	148946	<i>1.68</i>	148968	<i>1.68</i>	3072	<b>0.86</b>	< 1	<i>1.17</i>	56
neos-933815	1137328	4060	84	193	100	< 1	2283670	<i>2.01</i>	3791	<b>0.93</b>	79	<b>0.95</b>	112	<b>0.58</b>	78	<b>0.78</b>	< 1	<i>1.06</i>	3966
neos-933966	649	2723	136937	136946	2723	< 1	447	<b>0.69</b>	1553	<b>0.57</b>	66945	<b>0.49</b>	66931	<b>0.49</b>	1553	<b>0.57</b>	< 1	0.98	67
neos-934278	1254	7200	348201	348917	4801	< 1	661	<b>0.53</b>	7200	1.00	405372	<i>1.16</i>	405996	<i>1.16</i>	2940	<b>0.61</b>	< 1	<b>0.89</b>	141
neos-934441	819	7200	248079	249147	5096	< 1	1185	<i>1.45</i>	7200	1.00	250987	1.01	252048	1.01	5058	0.99	< 1	<i>1.08</i>	320
neos-934531	19	145	14188	14195	145	141	13	<b>0.67</b>	134	<b>0.92</b>	13137	<b>0.93</b>	13155	<b>0.93</b>	134	<b>0.92</b>	131	<b>0.93</b>	145
neos-935234	951	7200	286657	288191	4681	1	1059	<i>1.11</i>	7200	1.00	182746	<b>0.64</b>	184443	<b>0.64</b>	5027	<i>1.07</i>	1	1.00	52
neos-935348	1007	7200	265175	266797	4739	1	1278	<i>1.27</i>	7200	1.00	174841	<b>0.66</b>	176604	<b>0.66</b>	4971	<i>1.05</i>	1	<b>0.93</b>	117
neos-935496	1021676	7200	7895	363953	2202	28	1078585	<i>1.06</i>	7200	1.00	4900	<b>0.62</b>	362464	1.00	649	<b>0.29</b>	10	<b>0.35</b>	15976
neos-935627	1245	7121	76421	79168	5837	1	831	<b>0.67</b>	7200	1.01	61843	<b>0.81</b>	64761	<b>0.82</b>	6277	<i>1.08</i>	1	<i>1.09</i>	46
neos-935674	865975	7200	6447	363224	915	12	867107	1.00	7200	1.00	7065	<i>1.10</i>	363531	1.00	1638	<i>1.79</i>	6	<b>0.54</b>	13769 $\checkmark$
neos-935769	965	3723	35913	38726	3707	1	1487	<i>1.54</i>	5857	<i>1.57</i>	34843	0.97	37130	0.96	4782	<i>1.29</i>	1	1.02	96
neos-936660	1567	7200	53953	55447	4496	1	747	<b>0.48</b>	6525	<b>0.91</b>	72195	<i>1.34</i>	73986	<i>1.33</i>	3701	<b>0.82</b>	1	<i>1.06</i>	15
neos-937446	848	5350	58516	60007	4366	1	698	<b>0.82</b>	5913	<i>1.11</i>	59290	1.01	60680	1.01	5182	<i>1.19</i>	1	<b>0.88</b>	35
neos-937511	442	5517	35226	36533	2510	1	691	<i>1.56</i>	5645	1.02	54094	<i>1.54</i>	55460	<i>1.52</i>	3689	<i>1.47</i>	1	<i>1.08</i>	32 $\checkmark$
neos-937815	1040	7200	75221	78283	4920	1	2205	<i>2.12</i>	7200	1.00	85926	<i>1.14</i>	88746	<i>1.13</i>	4528	<b>0.92</b>	1	<b>0.81</b>	86 $\checkmark$
neos-941262	1704	7200	87642	88289	3427	1	2150	<i>1.26</i>	7200	1.00	109596	<i>1.25</i>	110234	<i>1.25</i>	4471	<i>1.30</i>	1	1.00	94 $\checkmark$
neos-941313	52	2303	18320	18320	1865	152	24	<b>0.46</b>	1418	<b>0.62</b>	17221	<b>0.94</b>	17216	<b>0.94</b>	1418	<b>0.76</b>	152	1.00	1028
neos-941698	56	11	902	902	11	6	184	<i>3.32</i>	15	<i>1.35</i>	1148	<i>1.27</i>	1148	<i>1.27</i>	15	<i>1.35</i>	7	<i>1.24</i>	94
neos-941717	952413	7200	4207	93682	337	19	1095340	<i>1.15</i>	7200	1.00	4972	<i>1.18</i>	94351	1.01	2756	<i>8.18</i>	16	<b>0.84</b>	8468

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Instance	default						confdiving													$\mathbf{C}$	$\mathbf{I}$
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$			
neos-941782	1666693	7200	3137	88235	2091	12	1378285	<b>0.83</b>	7200	1.00	3322	<i>1.06</i>	92469	<i>1.05</i>	4251	<i>2.03</i>	18	<i>1.47</i>	14047		
neos-942323	472	7	170	202	4	1	558	<i>1.18</i>	7	1.03	149	<b>0.88</b>	184	<b>0.91</b>	4	<i>1.24</i>	1	<b>0.65</b>	239 $\checkmark$		
neos-942830	658868	1928	1115	7834	30	4	416475	<b>0.63</b>	1272	<b>0.66</b>	1150	1.03	5906	<b>0.75</b>	41	<i>1.38</i>	5	<i>1.23</i>	1886		
neos-942886	1	1	24	720000	7200	7200	1	1.00	1	1.00	22	<b>0.94</b>	720000	1.00	7200	1.00	7200	1.00	10		
neos-948126	1733	7200	152485	154718	6094	1	1601	<b>0.92</b>	7200	1.00	181224	<i>1.19</i>	183454	<i>1.19</i>	5578	<b>0.92</b>	1	1.03	32 $\checkmark$		
neos-948268	16	35	3523	3519	35	35	13	<b>0.81</b>	39	<i>1.10</i>	3883	<i>1.10</i>	3886	<i>1.10</i>	39	<i>1.10</i>	39	<i>1.10</i>	0		
neos-948346	139	7200	205860	208360	3768	< 1	95	<b>0.68</b>	7200	1.00	169312	<b>0.82</b>	171288	<b>0.82</b>	3534	<b>0.94</b>	< 1	<b>0.75</b>	309 $\checkmark$		
neos-950242	8547	7200	62818	424595	776	484	6934	<b>0.81</b>	7200	1.00	84972	<i>1.35</i>	414309	0.98	940	<i>1.21</i>	827	<i>1.71</i>	166 $\checkmark$		
neos-952987	14	7200	720002	720002	7200	7200	16	<i>1.21</i>	7200	1.00	720002	1.00	720002	1.00	7200	1.00	7200	1.00	40		
neos-953928	50	559	1891	5485	558	< 1	73	<i>1.46</i>	566	1.01	2406	<i>1.27</i>	6094	<i>1.11</i>	498	<b>0.89</b>	< 1	<b>0.88</b>	36 $\checkmark$		
neos-954925	226	5685	8847	10366	2651	< 1	232	1.03	5550	0.98	10873	<i>1.23</i>	12686	<i>1.22</i>	3242	<i>1.22</i>	< 1	<i>1.23</i>	115 $\checkmark$		
neos-955215	25278	20	45	47	6	< 1	46070	<i>1.82</i>	25	<i>1.22</i>	44	0.96	47	0.99	7	<i>1.11</i>	< 1	0.96	168		
neos-955800	460336	6748	6314	225508	206	42	409899	<b>0.89</b>	6299	<b>0.93</b>	5871	<b>0.93</b>	201837	<b>0.90</b>	236	<i>1.15</i>	44	<i>1.06</i>	2006 $\checkmark$		
neos-956971	242	5526	4515	5960	3850	< 1	317	<i>1.31</i>	5724	1.04	6412	<i>1.42</i>	8033	<i>1.35</i>	2089	<b>0.54</b>	< 1	<i>1.13</i>	73 $\checkmark$		
neos-957143	319	2126	2158	3062	2126	< 1	227	<b>0.71</b>	2307	<i>1.09</i>	2286	<i>1.06</i>	3196	1.04	2307	<i>1.09</i>	< 1	<b>0.95</b>	16		
neos-957270	1	2	233	234	2	2	1	1.00	2	0.99	232	0.99	232	0.99	2	0.99	2	0.99	0		
neos-957323	3	97	574	2323	80	< 1	4	<i>1.73</i>	96	1.00	609	<i>1.06</i>	2353	1.01	85	<i>1.07</i>	< 1	<b>0.84</b>	3 $\checkmark$		
neos-957389	1	16	1615	1625	16	16	1	1.00	16	1.00	1615	1.00	1620	1.00	16	1.00	16	1.00	0		
neos-960392	201	1760	23086	23098	1760	< 1	176	<b>0.87</b>	1919	<i>1.09</i>	28447	<i>1.23</i>	28426	<i>1.23</i>	1919	<i>1.09</i>	< 1	1.02	127		
neos-983171	1042	7200	116979	119936	3701	1	2108	<i>2.02</i>	7200	1.00	102659	<b>0.88</b>	105677	<b>0.88</b>	4815	<i>1.30</i>	1	0.99	95 $\checkmark$		
neos-984165	1456	7200	127659	132256	4399	1	1295	<b>0.89</b>	7200	1.00	178821	<i>1.40</i>	183123	<i>1.38</i>	5786	<i>1.32</i>	1	1.00	55 $\checkmark$		
newdano	1307144	6819	5482	130091	2922	< 1	1390208	<i>1.06</i>	6909	1.01	6164	<i>1.12</i>	144565	<i>1.11</i>	3718	<i>1.27</i>	< 1	<i>1.29</i>	859 $\checkmark$		
nsa	166	2	156	156	2	2	172	1.04	2	0.98	149	0.96	152	0.97	2	0.98	2	0.97	9		
nug08	2	50	986	1258	42	1	2	<i>1.11</i>	66	<i>1.32</i>	381	<b>0.39</b>	735	<b>0.58</b>	60	<i>1.42</i>	1	0.98	77 $\checkmark$		
p6b	536562	7200	38900	197930	2785	< 1	536070	1.00	7200	1.00	38901	1.00	197963	1.00	2783	1.00	< 1	1.00	207		
pg	2946	653	1401	3859	564	< 1	3437	<i>1.17</i>	546	<b>0.84</b>	1188	<b>0.85</b>	3418	<b>0.89</b>	484	<b>0.86</b>	< 1	<i>1.20</i>	20		
pg5_34	145643	1556	257	753	997	< 1	190791	<i>1.31</i>	2926	<i>1.88</i>	399	<i>1.55</i>	492	<b>0.65</b>	1295	<i>1.30</i>	< 1	1.00	111 $\checkmark$		
prod1	24729	20	12	242	2	< 1	26524	<i>1.07</i>	22	<i>1.10</i>	12	0.97	149	<b>0.62</b>	1	<b>0.56</b>	< 1	<b>0.86</b>	539 $\checkmark$		
prod2	85658	94	344	188	94	< 1	89214	1.04	101	<i>1.07</i>	328	<b>0.95</b>	366	<i>1.95</i>	99	<i>1.05</i>	< 1	1.00	1842		
qap10	3	90	2010	3548	79	4	3	<b>0.90</b>	94	<i>1.05</i>	2071	1.03	3626	1.02	82	1.03	4	1.02	0		

cont. on next page

**Table 6:** Detailed computational results on CORAL test set. The table shows the absolute and relative numbers of nodes ( $\mathbf{N}$ ,  $\mathbf{N}_Q$ ), solving time ( $\mathbf{T}$ ,  $\mathbf{T}_Q$ ), primal integral ( $\mathbf{PI}$ ,  $\mathbf{PI}_Q$ ), primal-dual integral ( $\mathbf{PDI}$ ,  $\mathbf{PDI}_Q$ ), time to best ( $\mathbf{TtB}$ ,  $\mathbf{TtB}_Q$ ) and first solution ( $\mathbf{TtF}$ ,  $\mathbf{TtF}_Q$ ), and number of conflicts found by conflict diving ( $\mathbf{C}$ ). The right-most column ( $\mathbf{I}$ ) indicates whether at least one improving solution was found by conflict diving ( $\checkmark$ ). All changes in the numbers of at least 5% are highlighted in bold and blue (**improvement**) or italic and red (*deterioration*).

Instance	default						confdiving													
	$\mathbf{N}$	$\mathbf{T}$	$\mathbf{PI}$	$\mathbf{PDI}$	$\mathbf{TtB}$	$\mathbf{TtF}$	$\mathbf{N}$	$\mathbf{N}_Q$	$\mathbf{T}$	$\mathbf{T}_Q$	$\mathbf{PI}$	$\mathbf{PI}_Q$	$\mathbf{PDI}$	$\mathbf{PDI}_Q$	$\mathbf{TtB}$	$\mathbf{TtB}_Q$	$\mathbf{TtF}$	$\mathbf{TtF}_Q$	$\mathbf{C}$	$\mathbf{I}$
ramos3	33	7200	116043	290943	< 1	< 1	33	1.02	7200	1.00	116043	1.00	290543	1.00	< 1	0.97	< 1	1.00		0
ran14x18_1	724840	2031	853	5664	615	< 1	754078	1.04	2421	<i>1.19</i>	1089	<i>1.28</i>	6318	<i>1.12</i>	1053	<i>1.71</i>	< 1	1.00		416
rlp1	40206966	7200	2	48004	< 1	< 1	41817546	1.04	7200	1.00	2	<b>0.75</b>	48003	1.00	< 1	<b>0.72</b>	< 1	<b>0.83</b>	302342	$\checkmark$
roy	2	1	2	4	< 1	< 1	2	1.00	1	1.02	2	<b>0.95</b>	4	<i>1.07</i>	< 1	<i>1.10</i>	< 1	<b>0.86</b>	108	$\checkmark$
seymour-disj-10	97420	7200	2025	13136	2992	< 1	97507	1.00	7200	1.00	1492	<b>0.74</b>	12452	<b>0.95</b>	1980	<b>0.66</b>	< 1	<b>0.88</b>	702	
sp97ic	25579	7200	16558	35392	2210	< 1	31960	<i>1.25</i>	7200	1.00	14393	<b>0.87</b>	33563	<b>0.95</b>	4194	<i>1.90</i>	< 1	0.98	175	
sp98ar	2686	7200	35560	49360	4360	40	2502	<b>0.93</b>	7200	1.00	40340	<i>1.13</i>	53675	<i>1.09</i>	4738	<i>1.09</i>	38	<b>0.93</b>	68	
sp98ic	47572	7200	22132	30460	6050	1	55434	<i>1.17</i>	7200	1.00	19883	<b>0.90</b>	28943	<b>0.95</b>	4513	<b>0.75</b>	1	1.00	6444	$\checkmark$
sp98ir	4915	80	271	345	56	1	6741	<i>1.37</i>	101	<i>1.27</i>	295	<i>1.09</i>	385	<i>1.12</i>	68	<i>1.21</i>	1	0.96	308	
geom.	2259.63	333.16	-	-	133.13	0.99	2117.84	0.94	327.87	0.98	-	-	5249.79	-	134.44	1.01	0.96	0.97	-	
shgeom.	5026.97	362.44	1463.79	5664.86	161.23	3.74	4930.14	0.98	357.28	0.99	1504.23	1.03	5629.40	0.99	162.40	1.01	3.67	0.98	288.71	