

Editorial

Introducing the “Mathematical Modelling and Numerical Simulation of Combustion and Fire” Section of the Journal *Fire*

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It is my immense pleasure to assume the role of Editor-in-Chief for the “Mathematical Modelling and Numerical Simulation of Combustion and Fire” Section of *Fire*, which is intended to take a leading role in the dissemination of high-quality research in this area.

With the increase in the available computer resources, as well as computational methods and tools, the predictive capability and impact of simulation techniques are continuously increasing, and numerical simulations are being used as tools of prediction and analysis with increasing rate in all areas of science and engineering.

In this section of the journal, we aim to grant full place to this development and emphasize the importance of modelling and simulation in combustion and fire research, providing a dedicated open-access platform to scientists and engineers for disseminating information on the development, application, and improvement of mathematical and numerical models, as well as software tools in this field.

As combustion and fire science share the same fundamentals, but differ in purpose, they have a strong overlap in the area of mathematical and numerical modelling. Therefore, we find it just natural to appeal to both research communities at the same time, and provide a common platform to scientists and engineers from both areas. This approach, which may be seen as a novel feature of this section, is intended to improve the interaction between both communities and exploit the available synergistic potentials.

Thus, contributions pertaining to mathematical modelling and numerical simulation with focus on combustion or fire are equally welcome to this section.

Although the feasibility of applying complex models is increasing with the increase in computational capabilities, simplified models continue to keep their role. As the universality of models increases with modelling complexity, simplified models, which have the advantage of being cost-effective, can also attain high predictive capability when applied in their range of validity. Thus, the criterion for the coverage is not how complex a model is, but the novelty and ingenuity associated with the approach in the context of application. Approaches based on the soft computing techniques, which are also being increasingly used, are also within the scope.

We believe that intelligent application is of comparable value to development work. Practical problems may be so complex that a high level of ingenuity may be required in their treatment. Thus, innovative applications of models and software tools are also invited.

Although the section is devoted to mathematical and numerical methods, adequately documented experimental work that can serve as a validation database for the models is also within the coverage.

It is my absolute pleasure to welcome all scientists and engineers interested in the mathematical and numerical modelling of combustion and fire phenomena to this new forum.



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