Symposium title:

"Modelling and Optimisation for Coupled Multi-Physics Processes"

Symposium organisers:

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Symposium abstract:

Many engineering processes often involve multiphysics coupling between solid mechanics and other fields of physics such as heat transfer, electromagnetism, metallurgy, chemistry…

The first attempts to carry out numerical modelling of these processes often had to be based on simplifying assumptions and thus neglect multiphysics couplings. Nowadays, thanks to breakthroughs in terms of computational power and numerical analysis methods, it is becoming possible to carry out coupled multiphysics modelling of these processes. A main research topic lies with the development of efficient optimisation strategies in the context of multi-physics processes. Prior to applying optimisation techniques it is vital to identify a route to exploring the parameter space in such a way that will yield useful results within a practical time- and compute- scale.

The aim of this mini-symposium is thus to bring together scientists dealing with computational modelling of coupled multi-physics problems and the challenges of optimisation in this context.

The joint IACM/ECCOMAS framework is well-suited for these topics since it provides a forum for the latest developments in computational mechanics, as well as computational methods in applied sciences and engineering.

This symposium will thus be interesting for researchers developing advanced computational modelling and optimisation tools for multi-physics couplings (solid mechanics, heat transfer, electromagnetism, chemistry...)

Topics of interest include: optimisation strategies and algorithms, computational time reduction, parallel computing, new efficient and stable approaches for multiphysics problems, loose or strong coupling strategies, applications to linear and nonlinear problems, software tools selection (single or multiple codes), …