Computational interface mechanics in coupled problems

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ABSTRACT

**App. 400 words**

The main objective of this mini-symposium is to present and discuss both state-of-the-art and novel numerical strategies for domain decomposition and partitioned analysis within coupled problems such as fluid-structure interaction, thermo-mechanical problems, multi-physical problems in solid mechanics, smart materials and adaptive structures. The mini-symposium is particularly focused on advanced strategies for the coupling of different domains with mesh tying techniques and on the treatment of different time scales.

Special attention is paid to the dynamics of interfaces including solution accuracy, energy preserving properties, and stability of the underlying numerical methods capturing the dynamics of interface problems. Contributions on advanced time-stepping techniques for staggered coupling strategies, including heterogeneous asynchronous time integrators, Lie-group time integrators and others are also welcome.

The proposed mini-symposium especially encourages contributors to put an emphasis on implementation aspects, parallel computing, HPC and cloud computing for interface multiphysics. Challenging applications of coupled interface dynamics related to contact-impact problems and fluid-structure interaction as well as dynamic sub-structuring, model order reduction and data-driven techniques (based on AI / ML etc.) round off the thematic portfolio.

Each contribution should thoroughly address and discuss the accuracy, robustness, and performance of the proposed models and numerical techniques. Moreover, comparisons with other classical numerical methods and / or available experiments should be drawn. All in all, the objective of the mini-symposium is to share ideas and foster scientific exchange with regard to the formulation and numerical solution of interface mechanics in coupled problems. Being multidisciplinary by nature, the mini-smyposium advances the vision of accounting for all relevant complexities involved in the physical description of real-life problems and challenging application scenarios.