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NEW CHALLENGES ON COMPUTATIONAL CONTACT MECHANICS AND INTERFACE MODELS

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ABSTRACT

Ideas on contact, friction and wear have been the corner stone of the industrial development for over three centuries. Yet, the modeling of these complex phenomena is many times understood as an empirical art. On the other hand, computational models have been developed during the last decades to handle contact between rigid/flexible bodies. These are currently frequently used by industry in CAE. Due to the complexity of contact and related topics, new computational models are subject of interest of many research groups in the world, in order to diminish the gap between the empirical procedures and the establishment of better and more robust model predictions.

The solution of multiscale-multiphysics processes at different length and time scales is a mathematical challenge that necessitates a comprehensive understanding of these phenomena. In addition, novel approaches are needed to account for the complexity arising from the interaction of multiple scales and physical phenomena, especially when contact can occur or interfaces are present in the model.

The goal of the mini-symposium is to provide a forum to further promote communications between mathematicians, mechanicians and material scientists.

The mini-symposium aims to focus on both, quasi-static and dynamic problems involving contact, friction and wear. The topics of interest include (but are not limited to)

- Multiscale modeling approaches for interface constitutive laws

- Numerical contact modeling

- Multiscale and multiphysics approaches involving friction

- Approaches to damage and wear at the interface

- Debonding and delamination problems

- Rate and state dependent friction laws for dynamic problems

The minisymposium is especially interested in contributions involving contact models and multiscale and multiphysics approaches that go beyond simplistic parameter-based models. The minisymposium encourages contributions that present results using methods beyond those found directly in commercial software. Also of interest are contributions that propose numerical methods and ideas leading to model reduction in contact problems.