

MULTISCALE MODELING AND SIMULATION OF SURFACES IN CONTACT: MECHANICS OF CONTACT, FRICTION AND WEAR

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ABSTRACT

Modeling the interactions of two surfaces that come into contact and slide over each other presents many challenges. This is due to the fact that the process emerges from multiple nonlinear and intertwined mechanical phenomena including adhesion, plasticity and fracture, which occur at various length scales, ranging from the asperity level to the size of engineering components.

This mini-symposium aims to strengthen interdisciplinary links between the solid mechanics and tribology communities to model surface and bulk phenomena needed for a better understanding of the mechanics of contact, friction and wear at different scales. The focus will be on the newest theoretical and numerical developments for modeling elastic and inelastic deformation and degradation of material surfaces during contact from the atomic to the macroscopic scale.

Topics of interest include, but are not limited to, the following areas:

- Modeling elastic and inelastic deformation of surfaces in contact
- Modeling subsurface plasticity, damage and crack propagation during sliding contact
- Modeling and simulations of adhesive contact, friction and wear
- Development of new continuum and discrete numerical techniques in the field of contact mechanics.