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## The role of interphases and interfaces in the overall behavior of composites

Paras Kumar<sup>1,2,\*</sup>; Soheil Firooz<sup>1</sup>

<sup>1</sup> Institute of Applied Mechanics, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

<sup>2</sup> Competence Unit for Scientific Computing, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

In the past decades, composites have played a promising role in a broad variety of applications which resulted in a large body of literature on the topic. The overall behavior of composites mainly depends on the morphology of the underlying micro-structure, i.e. volume fraction, spatial distribution, shape, and size of their constituents at the micro-scale. Thus, predicting the effective response of composites is a challenging task and requires sophisticated techniques such as homogenization.

Interphase regions form between the constituents of composites through various underlying mechanisms such as mechanical or chemical adherence, roughness, and coating. Such regions play a crucial role in influencing the overall response of the composite medium. In particular, the advent of nano-structured materials with large area-to-volume ratio has stimulated numerous investigations on interphase effects due to their prominent contributions to material properties. A well-established strategy to capture a finite thickness interphase behavior is to replace it with a zero-thickness interface model characterized by its own displacement and/or traction jumps, resulting in different interface models. In addition, accounting for surface and interface effects enables capturing size effect which has been regarded as one of the major shortcoming of classical homogenization.

This mini-symposium aims to gather recent advancements in modeling and simulation of the overall behavior of composites, with emphasis on the role of interphases and interfaces between their constituents.

Topics of interest include, but are not limited to:

- Interphases and interfaces in composite materials
- Surface and interface elasticity and inelasticity
- Homogenization techniques (analytical and computational)
- Modeling of fracture in composites using discrete (e.g. XFEM) or/and diffuse approaches (e.g. Phase-Field Fracture)
- Multiscale modeling of elastic, inelastic and fracture response in composites
- Experimental validation
- Micro-structure generation

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\*Corresponding author: Paras Kumar (✉ [paras.kumar@fau.de](mailto:paras.kumar@fau.de))