ADVANCED MATERIALS AND SMART STRUCTURES: MODELING, SIMULATION AND TESTING

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MINISYMPOSIUM

This minisymposium is intended as a forum for presentation and discussion of the results and problems related to mathematical modeling, numerical simulation and experimental testing of advanced materials and smart structures. Of great interest are innovative engineered cementitious composites with constituent phases, e.g. with shape memory materials (alloys, polymers), which provide the composites with special functionalities, e.g. the ability of self-healing or self-centering, or high damping capacity.

Different scales of observation (electron and optical microscopy, digital image correlation) and description via multiscale methods of averaging and computational homogenization can be considered, including microscopic, mesoscopic and macroscopic scales. The main goal is to find the constitutive relations, taking into account the influence of the interfaces between the constituent phases, to assess the effective properties of advanced materials and finally to build the computational model (digital twin) of the material and structures made thereof in the era of digital technology.

Presentation of both deterministic and stochastic models and solution techniques for the coupled chemo-hygro-thermo-mechanical processes as well as deterioration processes in advanced materials and smart structures are welcome within the framework of this minisymposium.