

## Special Issue on Pavement Analysis and Design by Multiphysics

# CALL FOR PAPERS

Reliable and sustainable pavement infrastructure is critical for present economic and environmental challenges. The complexity of pavement analysis and design stems from diverse pavement materials, heavy traffic, and changing climate. The reliability of a pavement design depends on the extent of representation of this complexity in the prediction of various forms of distress that limit the effective service life of the pavement. The pavement materials need to be treated as they actually are and the analysis should take into account the actual coupled behaviors of materials, structures, traffic, and environmental conditions.

From a physical point of view, prediction of pavement performance is a multiphysics problem, which involves and couples the physics like mechanical responses (viscoelastic recoverable, plastic unrecoverable, time-dependent fracture, and damage evolution), moisture diffusion, heat transfer, oxidation reaction, and so on. Questions still remain about appropriate representation of each physical process and characterization of the circular dependence between each other. Multiple physical processes need to be integrated to predict pavement material deterioration and structural distresses as an analysis and design platform.

Thus, this special issue aims to collect studies regarding applications of multiphysical concepts and approaches to characterize pavement materials and predict pavement performance. The pavement materials may include asphalt concrete, cement treated materials, granular materials, soils, geosynthetics, and other additives.

Potential topics include but are not limited to the following:

- ▶ Experimental investigation of engineering properties of pavement materials
- ▶ Mechanistic models of pavement materials and performance
- ▶ Multiphysical constitutive modelling
- ▶ Microstructure and morphology of pavement materials
- ▶ Multiphysics-coupled modeling of environmental effects
- ▶ Numerical simulations of pavement multiphysics
- ▶ Pavement distress modeling and predictions
- ▶ Multiscale cohesive and adhesive failure
- ▶ Use of innovative pavement materials in multiphysical environment

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Papers are published upon acceptance, regardless of the Special Issue publication date.

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