NONLOCAL MODELS FOR MECHANICS AND DIFFUSION

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ABSTRACT

Nonlocal models provide an alternative framework to overcome some of the limitations presented in PDE-based local models. Examples include peridynamics, a nonlocal extension of classical continuum mechanics, and nonlocal p-Laplacian diffusion models, both of which admit much larger solution spaces than their local PDE-based counterparts. Peridynamics naturally admits discontinuous solutions and provides a framework for the description of material failure and damage. Nonlocal p-Laplacian diffusion models include anomalous diffusion. In addition, nonlocal models introduce length scales, which can be used for multiscale modeling. This minisymposium invites contributions on recent developments in peridynamics, nonlocal diffusion, and other related nonlocal models.

Targeted themes:

- Peridynamics

- Nonlocal heat transfer, mass diffusion, and coupled models

- Nonlocal p-Laplacian and fractional Laplacian

- Meshfree and particle methods

- Discretization methods for nonlocal models

- Nonlocal boundary conditions

- Material failure and damage, dynamic and static fracture

- Fiber-reinforced composites, heterogeneous systems, and homogenization

- Multiscale modeling