

The peridynamic model in nonlocal elastodynamics

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Peridynamics is a nonlocal continuum theory which avoids spatial derivatives. It is believed to be suited for the description of fracture and other material failure, and to model multiscale problems. In this talk, we introduce the peridynamic model and discuss several aspects of its mathematical analysis. We review recent results on the existence of solutions to the peridynamic equation of motion for a large class of nonlinear pairwise force functions modeling isotropic microelastic material. We also discuss how these results are related to the general theory of nonlinear evolution equations of second order in time. Finally, we study the limit of vanishing nonlocality.