Analysis of the peridynamic model in nonlocal elasticity theory

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Peridynamics is a nonlocal continuum theory which avoids any spatial derivative. It is believed to be suited for the description of fracture and other material failure, and to model multiscale problems. In this talk, 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. Our method of proof applies also to other nonlocal evolution equations.