

Lessons learned in modeling ductile failure with peridynamics.

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The peridynamic theory of solid mechanics has shown great promise in modeling damage and failure of engineering materials since its inception over a decade ago. While a great deal of success has been demonstrated in its use for modeling the failure of brittle materials, the work on ductile materials and large-scale plasticity is not mature. This talk will focus on lessons learned in plasticity and damage growth-to-failure modeling experienced over the last several years of participation in Sandia National Laboratories Ductile Failure X-Prize challenge. Topics covered will include different computational codes utilized, plasticity models explored, time-integration schemes, and failure propagation methodologies. A frank discussion will be presented regarding challenges encountered, including analysts' errors, in order to share these experiences with the community.