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A modified Non-local GTN damage model for high strain rate loading NISHA MOHAN, Los Alamos National Lab — With local continuum damage models, the results are inherently highly sensitive with respect to the spatial discretization length. Therefore to overcome mesh dependence, a modified non-local formulation of GTN damage model is proposed here, to work under an Eulerian explicit finite volume framework. The GTN model also takes advantage of the equations of states to evolve the material properties under high pressures and temperatures. The model is applied to simulate the fracture mechanical test of a typical metallic pressure vessel. It captures the salient features of damage propagation, such as porosity led shear band-like structures and fragmentation under ductile failure. Hence, it is seen to capture damage realistically compared with experimental results. Post-processing is based on the porosity and stress state development at various stages of crack initiation and propagation.

Nisha Mohan
Los Alamos National Lab

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