

## Issues in Constitutive Modelling and Failure for Ductile Materials

\*Zhenyu Xue<sup>2</sup> and Ken Nahshon<sup>3</sup>

<sup>2</sup> Harvard University  
29 Oxford St  
Cambridge, MA 02138  
xue@deas.harvard.edu

<sup>3</sup> NSWC Carderock  
Building 19, B158  
9500 Macarthur Blvd  
West Bethesda, MD 20817  
ken.nahshon@navy.mil

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### ABSTRACT

The application of ductile fracture models to simulations of impact events of engineering interest, such as blast loadings and projectile impact, is a hotly debated topic. Recent experimental evidence has reiterated that ductile fracture is a strong function of the stress state as measured by stress triaxiality. However, it has become evident that fracture criteria and/or damage laws must account for the third invariant of stress in order to model ductile fracture correctly. This talk will consist of a brief discussion of the in-practice modelling of dynamic ductile failure in large scale structures followed by recent experimental data [1] that highlights the need for more sophisticated fracture criteria. Finally, an outline of a new formulation of the Gurson model that accounts for void shearing damage and takes into account all three stress invariants [2] will be presented.

### REFERENCES

- [1] Y. Bao, T. Wierzbicki, "On the fracture locus in equivalent strain and stress triaxiality space", *Int. J. Mech. Sci.* 2004, **46**: 81-98.
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