

# A multiphase flow model for elastoplastic-fluid interaction

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Qualitative properties of a macroscopic model describing elastic-plastic solids model are studied in a special case of the internal specific energy taken in separate form : it is the sum of the hydrodynamic part (depending only on the density and entropy), and the elastic part depending on other invariants excepting the density. In particular, the relaxation terms are constructed compatible with the von Mises yield criteria. Also, the Maxwell type material behavior is shown up: the deviatoric part of the stress tensor is decaying during plastic deformations. The extension of the model to the diffuse interface method will be presented. The ability of this model is demonstrated: Taylor impact, a perforation of a disc, etc.

**Key words** : elastic-plastic solids, viscoplasticity, large deformations, Godunov type methods, interface.

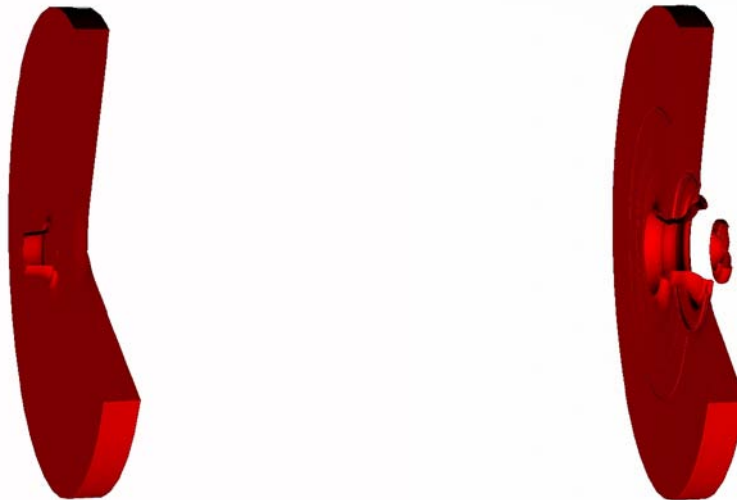


FIG. 1- Impact of a copper projectile on a copper disc surrounded by air. The copper projectile is highly deformed and the disc is perforated.

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