

Abstract Submitted
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Mesoscale Modelling of the Response of Aluminas N.K. BOURNE,
University of Manchester — The response of polycrystalline ceramics to shock loading has been studied for the past thirty years. Yet formulation of continuum models describing this has proved difficult. In uniaxial strain loading, failure mechanisms have been noted that proceed from the impact face. Particular problems have come to light when attempting to describe penetration into materials where the rod appears to dwell on the target surface. It has become clear that operating mechanisms are not completely described and so the technique of mesoscale simulation has been applied to understand composite behaviour at the grain scale. The alumina chosen for study has been experimentally investigated using plate impact loading. The microstructure has been determined by sectioning and visualizing using transmission electron microscopy. This microstructure has been converted into an input file for computer simulation of the experimental impacts. A view of the mesoscale response is presented and the mechanisms operating are highlighted. A connection with the macroscopic response is made to illustrate the features of the continuum response that originate at the mesoscale.

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