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The Role of Interfaces in Nucleation of Dynamic Damage in BCC Materials SARYU FENSIN, ERIC HAHN, TIMOTHY GERMANN, GEORGE GRAY III, Los Alamos National Lab — For ductile metals, the process of dynamic fracture occurs through nucleation, growth and coalescence of voids. For high purity single-phase metals, it has been observed by numerous investigators that voids tend to heterogeneously nucleate at grain boundaries and all grain boundaries are *not* equally susceptible to void nucleation. Several factors can affect the failure stress of a grain boundary, such as grain boundary structure, energy and excess volume, in addition to its interactions with dislocations. Flyer plate simulations were carried out for four boundary types with different energies and excess volumes in both materials. These boundaries were chosen as model systems to represent various boundaries observed in "real" materials. In this work, we investigate the role of interfaces in BCC (Ta) in void nucleation. The simulation results will be compared with bi-crystal gas-gun experiments. We will also explore the influence of grain boundary energy, excess volume and plasticity at the boundary on the failure stress of a grain boundary.

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