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The influence of grain boundary orientation on the strength and failure of tantalum bicrystals ERIC HAHN, SARYU FENSIN, TIMOTHY GERMANN, Los Alamos National Laboratory — Non-equilibrium molecular dynamics simulations are used to investigate the dynamic tensile response of tantalum bicrystals. Specimens with grain boundaries aligned either perpendicular or parallel to the shock direction are generated and subjected to shock and release. Future investigations will evaluate grain boundaries inclined relative to the shock front. We find that perpendicular boundaries show a higher propensity to fail, however local plasticity and crystalline orientation conspire such that some grain boundaries fail preferentially to one another. When the spall plane lies precisely along the grain boundary we observe the rapid separation of the boundary as growing voids rapidly coalesce with one another.

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