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X-Ray Tomography to Measure Size of Fragments from Penetration of High-Velocity Tungsten Rods ZACH STONE, Institute for Advanced Technology, ROMY HANNA, Department of Geological Sciences - UT Austin, STEPHAN BLESS, SCOTT LEVINSON, Institute for Advanced Technology, INSTITUTE FOR ADVANCED TECHNOLOGY COLLABORATION, DEPARTMENT OF GEOLOGICAL SCIENCES - UT AUSTIN COLLABORATION
— Behind-armor debris that results from tungsten rods penetrating armor steel at 2 km/s was studied by analysis of recovered fragments. Fragment recovery was by means of particleboard. Individual fragments were analyzed by x-ray tomography, which provides information for fragment identification, mass, shape, and penetration down to masses of a few milligrams. The experiments were complemented by AUTODYN SPH calculations to provide the exit velocity and the strain rate at the time of particle formation. There were four types of fragments: steel or tungsten, and generated from the channel or from the breakout through the target rear surface. Channel fragment motions were well described by Tate theory. Breakout fragments had velocities from the projectile remnant to the channel velocity, apparently depending on where in the projectile a fragment originated. The fragment size distribution was extremely broad and did not correlate well with simple uniform-fragment-size models, e.g., Grady Kipp

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