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Damage Experiments in a Cylindrical Geometry ANN KAUL, Los Alamos National Laboratory — Using a cylindrical configuration to study spallation damage allows for a natural recollection of the damaged material under proper driving conditions. In addition, the damaged material is able to come to a complete stop without the application of further forces. Specific areas of research include the damage initiation regime in convergent geometry, behavior of material recollected after damage, and effects of convergent geometry on the material response. These experiments challenge existing computational material models and databases and provide motivation to improve these models and increase the predictive capabilities of codes, as numerical modeling of such experiments requires the consideration of the effect of convergence and two-dimensional strains and shear stresses on the spallation profile of a material. A series of 3 experiments (R-Damage-0, -1 and -2) provided data about failure initiation of a well-characterized material (aluminum) in a cylindrical geometry. A second series of three experiments (R-Damage-3, -4 and -5) studied the behavior of material recollected after damage from pressures in the damage initiation regime. A third series of two experiments (R-Damage-6 and -7), scheduled for March 2009, will study the behavior of material recollected after complete failure. In addition to post-shot collection of the damaged target material for subsequent metallographic analysis, dynamic in-situ experimental diagnostics include velocimetry and transverse radial radiography. This presentation will cover the design, experimental results and numerical simulations for these experiments.

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