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Spallation Damage Experiments in Cylindrical Geometry ANN KAUL, Los Alamos National Laboratory — Spallation damage is the process of damage in a ductile material caused by void nucleation, growth and coalescence due to states of high tensile stress. Spallation damage of a ductile material is a concern in any situation where a high enough tensile wave can be produced. Typical spallation experiments are conducted using a gas gun in a planar, one-dimensional configuration. The assumption is made that the planar results translate directly to a cylindrical configuration. However, a cylindrical configuration is inherently two-dimensional due to the hoop stresses present in the target material. A series of 4 spall experiments on aluminum was successfully performed on the Atlas pulsed power facility at Los Alamos National Laboratory (LANL) in 2002. These experiments were conducted well above the velocity and/or pressure thresholds for nucleation and growth of voids. Planning for a series of 10 joint experiments by LANL and the All-Russia Research Institute of Experimental Physics (VNIIEF) are currently underway, with the first 3 planned for June and July. VNIIEF flux compression generators will be used to drive the experiments. These experiments are designed to explore the spallation damage threshold to determine if the window of incipient damage has moved in either velocity space or pressure space from the planar case. In addition, the effect of plastic work on the pressure wave profile as it moves through the material will be studied. Preliminary results for this initial series will be presented.

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