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Dynamic Compression of a Zr-Based Bulk Metallic Glass Confined by a 304 Stainless Steel Sleeve[1] MORGANA MARTIN, Georgia Institute of Technology, LASZLO KECSKES, Army Research Laboratory, NARESH THADHANI, Georgia Institute of Technology — We will report on our current work on dynamic high-strain-rate mechanical properties of a zirconium-based bulk metallic glass (LM106m) with and without a stainless steel confinement sleeve. The dynamic compression experiments were conducted using reverse Taylor anvil-on-rod impact tests to generate strain rates of $\sim 10^3$ s^{-1}. High-speed digital photography was used to obtain transient images of the deformation history. Velocity interferometry was also used to determine the back surface velocity of the impacted rod-shaped sample. These tests provide qualitative and quantitative information about the transient deformation and failure response of the specimens, which is used to better correlate the deformation path with the final recovered geometry. The recovered impacted specimens were analyzed using microscopy and AUTODYN modeling to elucidate the deformation and failure mechanisms of the bulk metallic glass and the effects of the altered stress state caused by the confinement sleeve. In this paper, the dynamic compression results and corresponding analysis of the failure mechanisms will be presented.

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