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Accelerating aluminum foils for shock wave experiments[1] STEPHAN NEFF, SANDRA STEIN, DAVID MARTINEZ, CHRISTOPHER PLECHATY, RADU PRESURA, University of Nevada, Reno — The interaction of shock waves with inhomogeneous background media is ubiquitous in astrophysics, taking place for expample when supernova remnants move through interstellar gas clouds. Scaled experiments of such interactions are possible by launching shock waves into inhomogeneous low-density foam targets.Using a pulsed-power accelerator (Zebra) with a short-circuit load, we are currently developing the methods and diagnostics necessary for such experiments at the Nevada Terawatt Facility. So far, we have successfully accelerated flyers (50 micron thick, 6 mm in diameter) to velocities of up to 8 km/s with a 1 MA current. We have also impacted these flyers on transparent Plexiglas targets and imaged the resulting shock with shadowgraphy. We are currently implementing improvements to be ready for scaled experiments. These improvements include using a current-multiplier (currents of up to 1.6 MA) to achieve higher velocities and implementing velocity interferometry (VISAR) to obtain a more accurate and time-resolved velocity measurement. In addition, we are currently implementing x-ray backlighting using a 50 TW short-pulse laser.

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