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Solid state Rayleigh-Taylor measurements in Ta and V at high pressures and strain rates[1] BRUCE A. REMINGTON, HYE-SOOK PARK, ROBERT CAVALLO, SHON PRISBREY, ROBERT RUDD, CHRIS PLECHATY, CHRIS WEHRENBERG, BRIAN MADDOX, NATALIE KOSTINSKI, MATTHEW TERRY, C.M. HUNTINGTON, LLNL — We will report on Rayleigh-Taylor (RT) strength experiments in solid-state driven foils of vanadium and tantalum at high strain rates (∼1.e7 1/s) and high pressures (∼1 Mbar), where softening (a decrease in strength) is observed when the strains get large. When the single-mode RT bubble penetration in this plastic flow regime reaches ∼20-30% of the initial foil thickness, the inferred high strength in the foils starts to drop. In the extreme, this drop in strength may be an indication of incipient failure. We will discuss the similarities and differences between the observed softening in the V-RT and Ta-RT experiments, and consider the implications for future planned experiments on the National Ignition Facility (NIF) at higher pressures (∼5 Mbar), but similar strain rates.

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