Abstract Submitted
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Plasma-driven Rayleigh-Taylor instabilities show unusual flow strength in tin[1] CAMELIA STAN, HYE-SOOK PARK, TOM LOCKARD, DAMIAN SWIFT, ROBERT RUDD, JAMES MCNANEY, Lawrence Livermore Natl Lab, MATTHEW HILL, Atomic Weapons Establishment — The Rayleigh-Taylor instability can be used to measure flow strength in solids, where the growth of perturbations is mitigated by the material's resistance to plastic flow.[1] This phenomenon has been exploited to investigate the strength of various materials at high strain rates, including Cu, Fe, Ta, and Pb.[2−4] Here, a Be plasma, formed by three lasers of Omega EP, drives a ramped compression pulse into a rippled Sn target to an average pressure of 1 Mbar. The growth of a rippled Sn surface against less dense CH plastic is measured using face-on radiography. We find that the growth is significantly less than predicted by a simple Steinberg-Guinan strength model. 1.Park, H.-S. *et al.* Grain-Size-Independent Plastic Flow at Ultrahigh Pressures and Strain Rates. *Phys. Rev. Lett.* **114**, (2015). 2.Huntington, C. M. *et al.* Investigating iron material strength up to 1 Mbar using Rayleigh-Taylor growth measurements. *AIP Conf. Proc.* **1793**, 110007 (2017). 3.McNaney, J. M. *et al.* Measurements of Rayleigh-Taylor growth in solid and liquid copper in the Mbar regime. in *Bull. of the Am. Phys. Soc.* (2019). 4.Krygier, A. *et al.* Extreme Hardening of Pb at High Pressure and Strain Rate. *Phys. Rev. Lett.* **123**, (2019).

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