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Effects of natural variability on the dynamic strength of chondrite meteorites for asteroid hazard mitigation BENJAMIN BRUGMAN, Michigan State University, DAWN GRANINGER, Lawrence Livermore National Laboratory, LAURA RIORDAN-CHEN, European Molecular Biology Laboratory, ERIC HERBOLD, MEGAN SYAL, Lawrence Livermore National Laboratory, SUSANNAH DORFMAN, Michigan State University, DAMIAN SWIFT, Lawrence Livermore National Laboratory — Successful mitigation of asteroid impact hazards requires accurate constraints on the rheology of potential impactors at strain rates relevant to the conditions required for deflection or disruption. Chondrite meteoroids are the most abundant near-Earth objects, and compositional analogs to potential asteroid hazards. They are heterogeneous, multiphase assemblages composed of remnant materials from the formation of the early solar system. To assess impact of compositional variability and texture on the dynamic strength of chondrites, we used laser-driven shock compression coupled with optical and SEM microanalysis of both shock-recovered and unshocked chondrites and their constituent silicate mineral phases. Chondrites and silicates were dynamically compressed using the Janus laser at the Jupiter Laser Facility at LLNL and the Trident laser, formerly at LANL. Results from the recovery analyses and velocity interferometry (VISAR) data will help constrain the effects of natural variability on strength and reduce uncertainty in planetary defense models.

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