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High-velocity impacts in regolith: insight from numerical models and experiments KATARINA MILJKOVIC, GARETH COLLINS, Imperial College London, MANISH PATEL, The Open University, DAVID CHAPMAN, WILLIAM PROUD, Imperial College London — High-velocity impacts are common events on planetary surfaces, from a constant micrometeoroid bombardment to infrequent but catastrophic large asteroid impacts that form giant craters. The consequences of such impacts depend, in part, on the properties of the planet surface, such as strength, porosity and surface gravity. The near-surface of many solar system bodies is a loose granular material composed of dust, soil and broken rock, known as regolith. Planetary regolith could have a range of material properties, hence it is difficult to specify its material model. As a result, experimental investigations of impacts on planetary surfaces often use sand as a regolith analogue material and hydrocode simulations of impact often assume a sand-like equation of state and strength model. In this study, we compare iSALE hydrocode simulations of impacts in sand and other porous granular materials with results from laboratory impact experiments to test and refine material models for regolith materials.

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