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**Coefficient of restitution and surface deformation for inelastic particle collisions in a liquid** ANGEL RUIZ-ANGULO, Universidad Nacional Autonoma de Mexico, MELANY HUNT, California Institute of Technology — Granular flow simulations rely on models of the coefficient of restitution (ratio of rebound speed to impact speed). For collisions in a liquid, the rebound speed depends primarily on the impact Stokes number. In this study, we measure the coefficient of restitution for conditions in which two parameters are important: the Stokes number,  $St$ , and the ratio of impact velocity to yield velocity,  $U^* = U_i/U_y$ , where the yield velocity,  $U_y$ , is the maximum speed for an elastic collision. We also measure the surface deformation (crater depth and radius) for a range of  $St$ ,  $U^*$ , and material properties. The results demonstrate that the surface deformation depends primarily on a corrected  $U^*$ , which incorporates the velocity decrease due to lubrication forces acting on the particle prior to collision. The particle rebound depends on the elastic strain energy stored during impact and on lubrication losses; these effects are incorporated in a model for the coefficient of restitution.

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