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**Collapse of a Compressed Granular Raft**[1] BEN DRUECKE, XIANG CHENG, SUNGYON LEE, University of Minnesota — Rigid, passive particles at the interface between two fluids provide a compression-resistant interface, thus opposing area-minimizing interfacial energy and providing the stabilizing effect characteristic of Pickering emulsions. We experimentally and analytically investigate the behavior of a flat particle raft under isotropic compression. A granular raft of glass spheres with diameter in the range of 0.1 to 2 mm is formed on a fluid-fluid interface within a conical funnel. Axisymmetric compression of the raft is imposed by draining fluid from the funnel. Two distinct modes of raft deformation and collapse are observed, depending on particle size and the two fluids forming the interface. In the first mode, individual particles fall from the raft in seemingly uncorrelated events. In the second, the raft collectively deforms and creases, akin to a Rayleigh-Taylor instability. We analytically and experimentally examine the two modes of raft collapse as a function of particle size, fluid densities and surface energies.

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