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Dilation of Granular Packings of Spheres and Non-Spherical Particles under Shear ABIGAIL POLIN, BEZ LADERMAN, CHRISTOPHER PEEL, JOHN R. ROYER, PAUL M. CHAIKIN, New York University — A parallelepiped shear cell is used to experimentally measure the dilation of particles prepared at different initial volume fractions from relatively loose assemblies to densely packed ones. The samples consist of spherical marbles, plastic ellipsoids and tetrahedral dice at the centimeter scale and specially prepared particles at the millimeter scale. Under quasi-static shear, loosely packed samples compact while densely packed particles dilate, as in previous studies. For small shear amplitudes, both the dilation and compaction of the tetrahedral packings is significantly larger than that of spheres.

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