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Contact breaking in frictionless granular packings[1] QIKAI WU, THIBAULT BERTRAND, COREY O'HERN, Yale University, MARK SHATTUCK, City College of the City University of New York — We numerically study the breaking of interparticle contact networks in static granular packings of frictionless bidisperse disks that are subjected to vibrations. The packings are created using an isotropic compression protocol at different values of the total potential energy per particle E_p. We first add displacements along a single vibrational mode i of the dynamical matrix to a given packing and calculate the minimum amplitude A_i of the perturbation at which the first interparticle contact breaks. We then identify the minimum amplitude $A_{\rm min}$ over all perturbations along each mode and study the distribution of $A_{\rm min}$ from an ensemble of packings at each E_p. We then study two-, three-, and multi-mode excitations and determine the dependence of $A_{\rm min}$ on the number of modes that are included in the perturbation.

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