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Localized Modes in Granular Chains

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Granular crystals are tightly-packed lattices (or more disordered arrangements) of solid particles that deform elastically when they contact each other. In the presence of precompression, they can exhibit breather solutions in the form of intrinsic localized modes and defect modes. I'll give an introduction to granular crystals and will then examine breathers in one-dimensional granular crystals (i.e., granular chains) in both models and experiments. I will give examples using both diatomic configurations and homogeneous configurations with defect particles. I will also consider disordered granular chains and discuss recent work on nonlinear Anderson localization and related phenomena in such systems.