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Fully ordered to disordered granular sphere packings with random deposition ARSHAD KUDROLLI, ANDREEA PANAITESCU, Department of Physics, Clark University, Worcester, MA 01610 — Granular packings are typically obtained by pouring grains into a container in a gravitational field as when sugar is poured into a jar, or grains into a silo. We deconstruct this method and study the impact on packing by simply varying the pour rate and energy of particles dropped randomly but spatially uniformly in a large container whose substrate can act as a template. We find that fully disordered packings are observed when large number of particles are added all at once but an ordered fcc crystal is observed when particles are added sequentially at random locations and allowed to come to rest before adding the next layer. By scanning the packings obtained by 3D X-ray tomography, we identify the positions of all the particles and the growth of order and defects. We present an analysis of the structures formed and compare and contrast it with packings obtained using other protocols including by cyclic shear [1]. [1]: "Nucleation and Crystal Growth in Sheared Granular Sphere Packings," Andreea Panaitescu, K. Anki Reddy, and Arshad Kudrolli, Phys. Rev. Lett. 108, 108001 (2012).

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