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Fragile granular jamming[1] MAHESH BANDI[2], MICHAEL RIVERA, Los Alamos National Laboratory, FLORENT KRZAKALA, ESPCI, Paris, France and CNLS, Los Alamos National Laboratory, ROBERT ECKE, Los Alamos National Laboratory — We demonstrate experimentally that the route to a jammed state for a set of bi-dispersed frictional disks, subjected to uni-axial compression from a random initial unjammed state, consists of a consolidation state, a fragile jammed state, and finally a rigid jammed state. In the consolidation regime, the pressure on the sides increases very slowly with the packing fraction ϕ, and there are no detectable stress chains. In the fragile jammed state, stress chains are visible, the pressure increases exponentially with ϕ, and the fraction of moving disks drops exponentially. Eventually, a final regime where particle displacements are below our resolution and the pressure varies approximately linearly with ϕ is reached. We argue that this scenario is generic for athermal frictional compressed particles.

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