Abstract Submitted
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**Force distributions and stress fluctuations in a triangular lattice of rigid bars**[1] BRIAN TIGHE, JOSHUA SOCOLAR, Physics Dept., Duke University, Durham, NC — We study the uniformly weighted ensemble of force balanced configurations on a triangular network of nontensile contact forces as a model of force distribution on a hyperstatic granular material. For periodic boundary conditions corresponding to isotropic compressive stress, the probability distribution for single-contact forces, $P(f)$, decays faster than exponentially, and a field closely related to the lattice version of the Airy stress function is found to have fluctuations characterized by a structure factor $S(q) \sim 1/q^4$. The super-exponential decay of $P(f)$ persists in lattices diluted to the rigidity percolation threshold. On the other hand, for anisotropic imposed stresses, a broader tail emerges, becoming a pure exponential in the limit of infinite lattice size and infinitely strong anisotropy.

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