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Creep and critical scaling in random spring networks[1]
BRIAN TIGHE, Delft University of Technology — Random networks of springs are a minimal model for physical, biological, and engineered materials ranging from foams and emulsions to biopolymer and bar-joint networks. Near the central force isostatic point, the creep response of damped networks is intimately tied to the presence or absence of floppy motions in the long time limit. We show that nearly isostatic networks display dynamical critical scaling, and that this scaling connects viscous flow and elastic deformation via a critical creep regime. We give scaling arguments for the critical exponents and confirm our predictions with numerics.

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