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Effective medium theory of semiflexible filamentous networks¹ MOUMITA DAS², Dept of Chemistry and Biochemistry, University of California, Los Angeles., ALEX J. LEVINE, Dept. of Chemistry and Biochemistry, University of California, Los Angeles., F.C. MACKINTOSH, Dept. of Physics, Vrije Universiteit, Amsterdam, The Netherlands. — We develop an effective medium approach to the mechanics of disordered, semiflexible polymer networks such as those forming the cytoskeleton and study their response to both spatially uniform and nonuniform strain. We identify distinct elastic regimes in which the effective filament bending stiffness or stretch modulus vanishes. We also show that our effective medium theory predicts a crossover between affine and non-affine strain, consistent with both prior numerical studies and scaling theory.

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