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The response to point forces in cytoskeletal networks ALEX J. LEVINE, University of Massachusetts, Amherst, DAVD HEAD, The University of Tokyo, FRED C. MACKINTOSH, Vrije Universiteit — Networks of semiflexible polymers that are cross-linked densely on the scale of their thermal persistence length form the structural basis of the cytoskeleton. These cytoskeletal networks, together with various cross-linking and other associated proteins largely determine the (visco-)elastic response of cells. We have found that semiflexible networks show a much more complex elastic response than traditional gels constructed of flexible polymers. In particular the both geometry of the deformation field under uniformly imposed shear stress and the effective shear modulus depend sensitively on the length of the constituent filaments relative the "nonaffinity length" that is a function of both the filament bending modulus and cross-linker density. In this talk I discuss the elastic Greens function in semiflexible networks, i.e. the response of these networks to localized forces. These investigations further highlight the role of the nonaffinity length and will improve our understanding of the action of molecular motors in the cytoskeleton. They will also facilitate the interpretation of microrheology data in semiflexible networks and in the cell.

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