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**Strongly anisotropic polymer networks** STEPHAN ULRICH, University of Goettingen, ANNETTE ZIPPELIUS, University of Goettingen, Max Planck Institute for Dynamics and Self-Organization, PANAYOTIS BENETATOS, Cavendish Laboratory, University of Cambridge — We investigate a network of worm-like chains, which are strongly oriented along a preferred direction due to an external field, boundary conditions, or a nematic environment. We discuss the effects of random permanent cross-links, whose density may follow an arbitrary distribution along the alignment direction. We show that the tilt modulus is unaffected by cross-links. As the cross-link density is increased beyond the gel point, the network develops a stiffness to in-plane shear deformations. Results for the shear elasticity and fluctuations of the polymer chains are presented. The case of cross-linking the chains on one end only is highlighted, it constitutes a simple model for polymer brushes. Moreover force-extension curves are presented for a toy model that consists of two cross-linked chains.

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