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Stress in the Mikado Model[1] MATHIJS VERMEULEN, ANWESHA BOSE, CORNELIS STORM , WOUTER G. ELLENBROEK, Eindhoven Univ of Tech, THEORY OF POLYMERS AND SOFT MATTER TEAM — The Mikado model is an often employed method to generate computer model architectures for fibrous networks. While it was originally devised for semiflexible polymers, it is regularly studied in the flexible limit (zero bending stiffness). In this limit, the Mikado method gives a floppy network in which every node has 4 or fewer springs connecting it to the rest of the network. While this guarantees that these networks should have many floppy modes, this in itself does not guarantee anything about their mechanics, as there could additionally be states of self-stress that would have a significant effect on the mechanical properties. In this talk, we first show that periodic Mikado networks, upon creation, do not have any states of self-stress (so that counting degrees of freedom following Maxwells simple argument gives the correct answer). However, the swelling (or shearing) of these networks gives rise to special geometric features in the network that can induce the states of self-stress.

[1]FOM

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