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Dynamics and stress generation in an actomyosin cytoskeleton

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This presentation focuses on dynamics and stress generation in a cortical cytoskeleton, which is a meshwork consisting of actin- and myosin-filaments and crosslinkers, located right underneath cell membrane. Such cortical cytoskeleton contributes to not only resisting deformation by external force but also inducing internal stress by myosin, motor protein. In particular, contractile motor-induced stress in a cortical cytoskeleton plays crucial roles in dynamic cellular behaviors, *e.g.*, cytokinesis and cell migration. In this presentation, I will mainly talk about our theoretical work on this system, which I was working on during my stay in Germany [1]. We proposed a theoretical model for dynamics and mechanics of an isotropic actomyosin meshwork and investigated its motor-induced contractility. Since a cortical cytoskeleton in a living cell should be flowable, we assumed a fluidic meshwork, in which there are only limited amount of crosslinkers and/or the network elements can undergo turnover processes. I will explain the model and results of this work and, if time permits, a few following developments.

[1] T. Hiraiwa and G. Salbreux, Phys. Rev. Lett. 116, 188101 (2016).