Abstract Submitted
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Instabilities in filament-motor solutions with crosslinkers.[1]
FALKO ZIEBERT, Materials Science Division, Argonne National Laboratory, 9700 South Cass Avenue, Argonne, IL 60439, RONNY PETER, WALTER ZIMMERMANN, Theoretical Physics Ia, University of Bayreuth, D-95440 Bayreuth, Germany — Filament-motor systems are in nonequilibrium due to the energy consumption during motor movement (via ATP hydrolysis), and thus display pattern and structure formation. We report on simple mesoscopic modeling based on conservation laws with active filament currents. We discuss instabilities in a recent experiment on actomyosin, where ATP is depleted in the presence of a small amount of crosslinker proteins. In the limit of high density of crosslinkers, we propose a model where transported filaments are coupled to an elastic crosslinked network, leading to oscillatory behavior.
References:
D. Smith, F. Ziebert, D. Humphrey, C. Duggan, W. Zimmermann and J. Kaes, submitted to Biophys. J. ; R. Peter, F. Ziebert and W. Zimmermann, submitted to Europhys. Lett.

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