Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Topological Edge Modes in Active Mikado Networks[1] DI ZHOU, LEYOU ZHANG, XIAOMING MAO, University of Michigan, Ann Arbor — Mechanical properties of disordered fiber networks are not only important in understanding a broad range of natural (such as the cytoskeleton and the extracellular matrix) and manmade materials (such as aerogels and porous media) but also exhibit interesting and rich physics. In this talk, we discuss how topological floppy edge modes can emerge from these fiber networks as a result of active driving. It is known that straight fibers in a network carries a state of self-stress and bears a bulk floppy mode. We find that, interestingly, by driving the network with a tiny perturbation, the bulk modes evolve into edge modes. We introduce a new transfer matrix formulation that can be applied to this strongly disordered system, to characterize the topological edge modes. We also discuss possible implications of these edge modes in biological processes.

[1]NSF-DMR-1609051

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Date submitted: 10 Nov 2016 Electronic form version 1.4