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Measuring the material properties of low Reynolds undulatory swimmers JOSUE SZNITMAN, PRASHANT PUROHIT, PAULO ARRATIA, University of Pennsylvania — *C. elegans* is a small ($\sim$ 1mm long), free-living nematode that is extensively used as a model organism for biological research, including genomics, cell biology, and neuroscience. In this talk, the swimming behavior of *C. elegans* is investigated both in experiments and in theory. Experiments focus on measuring the nematode swimming behavior (i.e. curvature, frequency, amplitude, etc) in small channels using high-speed imaging microscopy. The swimming kinematics is described using a simple model based on force and moment balances, where the animal is assumed to be modeled as an elastic slender filament immersed in a viscous fluid. We find that this simple model is able to capture the main features of the nematode swimming behavior. Further, we are able to quantify the material properties of the nematode tissue such as elastic and shear moduli by combining detailed experimental kinematics with the analytical model.

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