Abstract Submitted
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Direct micro-mechanical measurements of the material properties and motility of *C. elegans* MATILDA BACKHOLM, Department of Physics and Astronomy, McMaster University, Hamilton, ON, L8S 4M1, Canada, WILLIAM S. RYU, Department of Physics, University of Toronto, Toronto, ON, M5S 1A7, Canada, KARI DALNOKI-VERESS, Department of Physics and Astronomy, McMaster University, Hamilton, ON, L8S 4M1, Canada — The model organism *C. elegans*, a millimeter-sized nematode, provides an excellent biophysical system for both static and dynamic mechanical studies. The undulatory motion exhibited by the worm as it swims or crawls through a medium is ubiquitous in nature at scales from microns to meters, and has been the focus of intense research. However, for a successful description of this form of locomotion, a better knowledge of the material properties as well as the worm's output forces is needed. Here we present a new experimental assay, with which the material properties and dynamics of *C. elegans* can be directly probed. In this technique, we use the deflection of a very flexible micropipette to measure the flexural rigidity of *C. elegans* at all stages of its life cycle, as well as along the body of the adult worm. By modelling the worm as a viscoelastic material, we have achieved new insights into its mechanical properties. Furthermore, the forces involved during the undulatory motion of *C. elegans* have been studied. It is the hope that the direct experimental characterization of this model organism will provide guidance for theoretical treatments of undulatory locomotion in general.

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