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Bending of an elastic cantilever by gravity-driven flow of a liquid film MARINELA POPOVA, HYOUNGSOO KIM, Princeton University, PETER HOWELL, University of Oxford, HOWARD STONE, Princeton University — We experimentally study a gravity-driven liquid flow on a flexible beam. The elastic material bends due to the weight of the liquid. The relationship between hydrodynamics and elasticity is investigated by varying an applied flow rate, the bending stiffness of the beam, and the beam length. Surface tension effects are negligible for these experiments. We compare our results with a model that predicts the beam deformation in terms of two dimensionless parameters, one representing a dimensionless beam length and the other representing a dimensionless beam stiffness. The results span both small deformations as well as large deformations of the cantilever.

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