

Abstract Submitted
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Sedimentation of slender elastic filaments in a viscous liquid

VERONICA RASPA, LadHyX, Ecole polytechnique, ANKE LINDNER, OLIVIA DU ROURE, PMMH, ESPCI, CAMILLE DUPRAT, LadHyX, Ecole polytechnique — We explore experimentally the dynamics of slender flexible filaments sedimenting in a viscous fluid at low Reynolds number. The observed deformations and dynamics result from a balance between viscous, elastic and gravitational forces on the slender body and thus are characterized by a dimensionless elasto-gravity number. We present measurements of the filaments stationary shape, velocities and trajectories for different initial conditions and filament characteristics (i.e: density, bending rigidity, size). In particular, we observe bending and reorientation of the filament, and investigate the conditions under which the filament can buckle. The introduction of elasticity broadens the spectrum of accessible sedimentation stationary states, compared to those appearing for their rigid counterparts where nor bending or buckling are allowed.

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