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Nematode swimming and turning: locomotion of *C. Elegans* in bulk fluid and thin fluid layers[1] ALEJANDRO BILBAO, VENKAT PADMANABHAN, Texas Tech University, KENDRA RUMBAUGH, Texas Tech University Health Science Center, SIVA VANAPALLI, JERZY BLAWZDZIEWICZ, Texas Tech University — A millimeter-long nematode *C. Elegans* propels itself by performing sinous undulations, and it turns by assuming strongly curved Ω-shaped body postures. All these stereotyped motions can accurately be described in terms of piecewise-harmonic body curvature, which propagates backwards along the nematode length [PLoS ONE, 7: e40121 (2012)]. We combine our piecewise-harmonic-curvature description with accurate hydrodynamic bead-chain models to investigate swimming efficiency and maneuverability of the nematode in bulk fluid and in a thin fluid layer. We find that the nematode swims faster and maneuvers more efficiently under confinement, because of a larger transverse hydrodynamic resistance. However, the optimal swimming gate is only weakly affected.

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