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Impact of hydrodynamic stresses on bacterial flagella[1] DEBASISH DAS, EMILY RILEY, ERIC LAUGA, University of Cambridge — The locomotion of bacteria powered by helical filaments, such as Escherichia coli, critically involves the generation of flows and hydrodynamic stresses which lead to forces and moments balanced by the moment applied by the bacterial rotary motor (which is embedded in the cell wall) and the deformation of the short flexible hook. In this talk we use numerical computations to accurately compute these hydrodynamic stresses, to show how they critically lead to fluid-structure instabilities at the whole-cell level, and enquire if they can be used to rationalise experimental measurements of bacterial motor torques.

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