Force exerted by a Stokeslet on confining boundaries ALEXANDER MOROZOV, VIKTOR ŠKULTÉTY, School of Physics & Astronomy, University of Edinburgh, UK — Solutions to the Stokes equation can be constructed by combining suitably placed Stokelets and other singular solutions, that simultaneously satisfy the equation of motion and the boundary conditions. This approach has proven especially fruitful in describing the motion of small solid bodies and self-propelled particles. Recent debate on the pressure exerted by microswimmers on the walls of the enclosing container, together with the observations of the apparent viscosity of microswimmer suspensions being strongly affected by their presence, stresses the need to evaluate the forces exerted by microswimmers on solid boundaries.

Here, we study two archetypal problems: a Stokeslet next to a single flat boundary, and a Stokeslet confined in-between to parallel walls. This allows us to calculate forces exerted on the walls by microswimmers, and we find that while in the case of a single wall microswimmers exerts no total force on the wall, the force becomes nonzero in the latter. We estimate the pressure exerted on the wall by the typical dilute bacterial suspension used in experiments.

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