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**The hydrodynamics of interactions between two swimming bacteria** TAKUJI ISHIKAWA, GO SEKIYA, YOHSUKE IMAI, TAKAMI YAMAGUCHI, Tohoku University — This study evaluates the hydrodynamic interactions between two swimming bacteria precisely. We assume that each bacterium is force-free and torque-free, with a Stokes flow field around it. The geometry of each bacterium is modeled as a spherical or spheroidal body with a single helical flagellum. The movements of two interacting bacteria in an infinite fluid otherwise at rest are computed using a boundary element method and the trajectories of the two interacting bacteria and the stresslet are investigated. The results show that as the two bacteria approach each other, they change their orientations considerably in the near field. The bacteria always avoided each other; no stable pairwise swimming motion was observed in this study. The effects of the hydrodynamic interactions between two bacteria on the rheology and diffusivity of a semi-dilute bacterial suspension are discussed.

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