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Microswimmer and obstacle interactions mediated by pressure fields[1] FLORENCIO BALBOA USABIAGA, Flatiron Institute, QUENTIN BROSSEAU, Courant Institute, New York University, ENKELEIDA LUSHI, New Jersey Institute of Technology, YANG WU, New York University, LEIF RISTROPH , Courant Institute, New York University, JUN ZHANG, MICHAEL WARD, New York University, MICHAEL J. SHELLEY, Flatiron Institute — We revisit the problem of microswimmer orientation near boundaries. We will show how elongated swimmers create high and low pressure nodes around them and how these pressure nodes are enough to tilt the swimmers around obstacles. We address this problem with a combination of theory, simulations and experiments. We use the Rigid multiblob method to model phoretic swimmers near walls and compare the predictions with experiments of bimetallic micro-rods swimming in hydrogen peroxide solutions. Finally, we will use our mechanical explanation to suggest how phoretic swimmers can be designed to have preferred hydrodynamic interactions with walls.

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