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Microscopic filter feeders near boundaries RACHEL PEPPER, Harvard University, MARCUS ROPER, University of California, Berkely, SANGJIN RYU, Massachusetts Institutte of Technology, PAUL MATSUDIARA, National University of Singapore, HOWARD STONE, Princeton University — We show through calculations, simulations, and experiments that the eddies often observed near sessile filter feeders are due to the presence of nearby boundaries. We model the common filter feeder *Vorticella*, which is approx 50 μm across and which feeds by removing bacteria from ocean or pond water that it draws towards itself. We use an analytic stokeslet model and a Brinkman flow approximation with the organism modeled as a cylinder with two different boundary conditions to predict the size of the eddy caused by two parallel no-slip boundaries that represent the slides between which experimental observations are often made. We also use three-dimensional finite-element simulations to fully solve for the flow around a model *Vorticella*. Additionally, we track particles around live feeding *Vorticella* in order to determine the experimental flow field. Our models are in good agreement both with each other and with the experiments. We also show through calculations that filter feeders such as *Vorticella* can greatly enhance their nutrient uptake by feeding at an angle rather than perpendicular to a substrate.

Rachel Pepper
Harvard University

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