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Interaction of two spheres settling in a linearly stratified fluid MATTHIEU MERCIER, CLEMENT TOUPOINT, PATRICIA ERN, IMFT (Univ Toulouse III-INPT-UPS-CNRS) — The settling dynamics of small objects in stratified fluids is important to understand the fate of the biomass in lakes or oceanic environments, for industrial applications such as waste-water disposal. More specifically, the interaction of two settling bodies is a fundamental problem recently studied numerically for spheres. Experimental results are needed for validation, especially at low and moderate values of the Reynolds number, for different values of the Froude number, the other parameter of interest. We present experimental results on the interaction of two spheres settling in a linearly stratified fluid. The settling dynamics is investigated by tracking their trajectories in three dimensions, using a pair of cameras imaging two perpendicular planes. Two typical cases are observed, the horizontal repulsion of particles initially aligned horizontally, and the Drafting-Kissing-Tumbling of spheres initially aligned vertically. The influence of the initial positions of the spheres, the Reynolds and Froude numbers, is investigated to quantify these effects and their robustness, in comparison to the dynamics in an homogeneous fluid.

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