

[P29] Direct Measurements of Colloidal Hydrodynamics near Flat Boundaries Using Oscillating Optical Tweezers

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We studied the hydrodynamic interaction between a colloidal particle close to flat rigid boundaries and the surrounding fluid using oscillating optical tweezers. A colloidal particle located near walls provides a model system to study the behavior of more complex systems whose boundaries can be modeled as effective walls, such as a blood tube, cell membrane, and capillary tube in bio-MEMS. In this study, we measure the hydrodynamic interaction directly without using the Stokes-Einstein relation. Two different cases are studied: a colloidal sphere near a single flat wall and a colloidal sphere located at the midplane between two flat walls. The colloidal hydrodynamics is measured as a function of the distance between the particle and the walls, and is compared with the theoretical results from well-defined hydrodynamics approximations.