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Lateral wall effects on the immersed pendulum dynamics and its interaction with a downstream target FULING YANG, National Taiwan University, HONGSI CHEN, SOLID-LIQUID TWO-PHASE FLOW GROUP TEAM — The unsteady motion of a solid sphere in an incompressible viscous liquid and its interaction with solid boundaries has been examined and most existing knowledge concerns sphere motion in creeping flow regime or sphere collision dynamics. Much less investigated is when the solid sphere exhibits unsteady lateral motion relative to one or two planes. Thus, this work studies the dynamics of a fully immersed spherical pendulum when it moves midways between two lateral walls via systematic experiments. By changing the release angle and the liquid viscosity, a wide range of maximal particle Reynolds number, Re* from 3 to 295, were achieved without the presence of lateral walls. The same release was repeated with lateral walls imposed at various gaps, with a gap-to-diameter ratios W/D =1.2∼5.0, and the resulting maximum Re* were measured. We also estimated the coupling distance, Xc, when a downstream target sphere was set into motion by the impact sphere. If head-on collision was observed, the ratio of the relative sphere velocities after and before the collision were used to calculate the coefficient of restitution, e. The measured Re*, Xc, and e will be presented as a function of W/D along with some preliminary analysis.

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