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Sedimentation and suspension of a cylinder confined in a Hele Shaw cell HAROLD AURADOU, Lab. FAST Orsay France, VERONICA D'ANGELO, Grupo de Medios Porosos, Buenos Aires, Argentine, JEAN-PIERRE HULIN, Lab. FAST Orsay France, FRANCO-ARGENTINIAN INTERNATIONAL ASSOCIATED LABORATORY IN THE PHYSICS AND MECHANICS OF FLUIDS COLLABORATION — We present experiences of settling or suspension of a rigid horizontal cylinder moving between two vertical parallel plates. In this study, the ratio between the cylinder diameter and the cell aperture ranges between 0.4 and 0.9 and the Reynolds number is always below the value for vortex shedding at the rear of a fixed cylinder. For ratio below 0.5, the cylinder stays horizontal and translates vertically at a constant velocity. For ratio between 0.5 and 0.7, the cylinder is observed to oscillate in the gap of the cell. This induces a variation of the drag which in turn results in a vertical velocity which oscillates around a mean value. For confinement above 0.7, the cylinder flutters in the Hele Shaw plane. The periodic lateral motion of the cylinder is studied as function of the flow conditions. The dynamic of the system is studied as function of the Reynolds number, confinement and cylinder of various density are also considered. Our observations are compared to a recent study concerning confinement induced vibration for a tethered cylinder.

Harold Auradou
Lab. FAST Orsay France

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