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Motion and deformation of a vesicle in a Wall-Bounded Shear Flow ANDRES GONZALEZ-MANCERA, ALEXANDER LADINO, IVAN REY SUAREZ, CHAD LEIDY, Universidad de los Andes — The motion of a lipid vesicle near a plane wall is studied using a 3-d boundary integral method. Initially the vesicle is considered to be immersed in a quiescent semi infinite fluid and its motion is driven by the buoyant force due to which the vesicle moves downwards towards the wall. A contact area is formed between the vesicle and wall which will depend on the magnitude of the buoyant force and the elastic properties of the membrane (relationship characterized by the Bond number). Results are compared to experimental data obtained using giant lipid vesicles. When the external fluid is set to a shear flow, the motion of the vesicle is driven by the hydrodynamic forces acting on it. These forces deform the vesicle and sets it in motion. The shape and velocity of the vesicle depend on the intensity of the flow and the vesicle's membrane elastic properties (relationship characterized by the dimensionless capillary number). The velocity of motion of the particle is reported as function of both the Bond and the capillary numbers and different flow regimes are identified.

Andres Gonzalez-Mancera
Universidad de los Andes

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