Mobility of membrane-trapped particles HASSAN MASOUD, University of Nevada, Reno, HOWARD STONE, Princeton University — The translation or diffusion of particles along membranes or interfaces is of interest because it is a model system for describing basic features of interfacial hydrodynamics. It is also important in cellular signalling in biology and biophysics, and it can be used to deduce the rheological properties of surface films. Here, we consider the translational mobility of spherical and oblate spheroidal particles protruding into the surrounding subphase liquid. Both the subphase and surface film contribute to the resistance experienced by the particle, which is calculated as a function of the degree of protrusion as well as the viscosity contrast between the surface film and the surrounding fluid. The calculations are based on a combination of a perturbation expansion involving the particle shape and the Lorentz reciprocal theorem. It appears that just considering one term of the expansions is in very good agreement with available analytical and numerical results.

Hassan Masoud
University of Nevada, Reno