

# The lateral drift of an inertial prolate spheroid in Stokes flow

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## ABSTRACT

The motion of a rigid spheroidal particle in Stokes flow has been studied numerically. The method is based on a boundary integral formulation and a new specialized highly accurate quadrature method known as quadrature by expansion (QBX). It has been validated for inertial and non-inertial particles in both linear shear flow and a quadratic flow profile.

It has been found that inertial prolate spheroids in flows with a quadratic velocity profile in the absence of gravity experience a lateral drift towards regions in the fluid with higher shear rate. The drift velocity depends on the amount of particle inertia and vanishes in the extreme cases of very light and very heavy particles. We will discuss the origin of this drift.