1056-76-961 **Longhua Zhao*** (zlh@email.unc.edu), CB#3250, Phillips Hall, Chapal Hill, 27514, and **Roberto Camassa** and **Richard M. McLaughlin**. *Flow structure of a sphere or spheroid immersed in shear flows in the Stoke's regime.*

Building on work by Wu and Chwang who developed closed form exact solutions of the Stokes for the case of a sphere or spheroid embedded in a linear shear layer, we study the structure of such flows and document rigorously that the blocking behavior which was observed by Wu and Chwang for the two dimensional case occurs in the fully 3D case well. We solve the explicit and analytic solution for the particle trajectories for this fully 3D flow and compute explicitly the volume of the blocking region, which is seen to be infinite. We explore cases when the sphere or spheroid have centers displaced from the background shear symmetry line. We document an interesting bifurcation in the particle trajectories using numerical techniques. (Received September 18, 2009)