1145-VN-247 **Forest Mannan*** (fmannan@mines.edu) and **Karin Leiderman**. *Numerical Calculation of Weak Inertial Lift on Arbitrarily Shaped Objects Near a Plane.* Preliminary report.

The Navier-Stokes equations are a nonlinear set of equations that describe the motion of viscous fluids. They become the linear Stokes equations in situations when the Reynolds number (Re), a nondimensional parameter that relates inertial to viscous forces on the fluid, tends to zero. Many relevant real world flows occur at small but non-zero Re but these flows are generally well approximated with the Stokes equations. Nevertheless, the simplification to Stokes means that potentially important qualitative features that are inertial in origin will be lost. One approach to capture so-called weak inertial effects for small Re without wholly having to revert to the nonlinear Navier-Stokes equations is to formulate a new problem using lower-order terms from a series approximation in Re. Work in this direction has generally focused on analytic solutions and thus has been restricted to fairly simple geometries. We consider a numerical approach using the Method of Regularized Stokeslets to calculate the weak inertial lift on an arbitrarily shaped object with any prescribed movement near a plane wall. (Received August 24, 2018)