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Priya Shilpa Boindala* (pboindala@gmail.com), 1000 University Center Ln, School of Science and Technology, Georgia Gwinnett College, Lawrenceville, GA 30043. *New Minimal Representation of Self Propelled Swimmers in Stokes Flow Using Regularized Fundamental Solutions.*

We develop a new representation of self propelled swimmers in low Reynolds number viscous incompressible flow that efficiently and effectively captures collective dynamics in free space and in the presence of a wall/boundary. The representation developed uses regularized fundamental solutions of the Stokes equation and is derived so as to retain the fluid flow features produced by an organism but using only one or two singularity elements. We call this “minimal swimmer” representation. In this talk I will describe the minimal swimmer representation derived and present the computational experiments used to validate it. The motility of suspensions of these organisms and their interactions give rise to recurring regions of re-circulation and whirls. These regions exist even when the inertial forces are negligible and play a key role in transport of nutrients or other solutes suspended in the system. This study has applications in Biofilms and transport in micro-fluid devices and taxis problems (Received August 12, 2010)