1067-92-802 **Yicong Yong*** (yongyic@ufl.edu) and **Xingzhou Yang** (xyang@math.msstate.edu), 458 Allen Hall, Department of Mathematics and Statistics, Mississippi State University, Mississippi State, MS 39762. *Modeling Particle Dynamics around Choanoflagellates by the Regularized Stokeslets.* Preliminary report.

Choanoflagellates are unicellular microorganisms with a single flagellum surrounded by microvilli, slender fingerlike, very thin projections. Recent study shows that choanoflagellates are most relative to animals and they may reveal the origin of life. In this complex biological system, the helical beat of the flagellum is responsible for the motility of choanoflagellates. The microvilli can filter and take in the food particles or nutrient substances. We present a computational model to understand the particle dynamics around the choanoflagellates. The nutrient substances suspended within the fluid are modeled as neutral buoyant particles. The flagellum and the microvilli are treated as elastic structures in the model. In our computer simulations, we show the flow patterns by visualizing how the flagellum, microvilli, suspended particles interact with the surrounding fluid. Since the Reynolds number is very low, the fluid flow is modeled by Stokes equations. We use the regularized Stokeslets method, a grid free method, to solve the governing equations. The Runge-Kutta method is employed to solve the related ODE system. Numerical simulations will be presented. (Received September 14, 2010)