Stokesian Dynamics Simulation for Particulate Suspensions Flowing through Y-Shaped Bifurcating Channel MALLIKARJUNA MALLELA, PANKAJ TIWARI, ANUGRAH SINGH, Indian Inst of Tech-Guwahati — Suspension of particles dispersed in a fluid medium are encountered in various situations. Many methods, both analytical and numerical, have been developed for understanding and predicting the macroscopic equilibrium and transport properties of these multiphase systems. Stokesian dynamics(Brady and Bossis, 1988) is also one such simulation method which has been fairly successful towards this end. Many interesting phenomena that are often observed in the suspension flow, such as shear induced migration, size segregation, wall slip, etc. are not encountered in simple Newtonian homogeneous liquids. The shear-induced migration phenomena exhibited by concentrated suspensions lead to many interesting observations such as inhomogeneous distribution of the particles and blunting of velocity profiles. Moreover, this phenomenon causes the fractionation of fluid and particle when the suspension flows through the specially designed bifurcating geometries and have been attracting wide attention. In the present work, we are studying the distribution of the particles in the 2D Y-shaped geometry. We have also carried out simulations with varying relative flow rate in daughter branches by varying the width of the daughter branches to study the partitioning of the particlesin the daughter branche

Mallikarjuna Mallela
Indian Inst of Tech-Guwahati