INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Thesis Title: PARTICLE IMAGE VELOCIMETRY STUDIES OF SUSPENSION TRANSPORT IN BIFURCATING CHANNEL

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Experimental measurements of velocity and concentration profiles were carried out to study transport of non-colloidal suspension in bifurcating micro channels for diverging ,converging and diverging-converging flow conditions using a combination of Mirco Particle Image Velocimetry (PIV) and Particle Tracking Velicimetry (PTV) techniques. Migration of particles across the streamline was observed and symmetric velocity and concentration profile in the inlet branch becomes asymmetric in the daughter branches. Further migration of particles towards the center of the channel in the daughter branches makes the profiles again symmetric. The evolution of velocity and concentration profiles was observed to be different in the symmetric and asymmetric bifurcation channels. The comparison of the streamlines for the bulk flow and the particles showed significant deviation near the bifurcation region. This may explain why there is unequal flow and particle partitioning during flow of suspension in asymmetric bifurcating channels as reported in many previous studies. Due to irreversible nature of shear-induced particle migration, the profiles were not the same near the bifurcation locations for converging and diverging flow conditions.

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