

Abstract Submitted
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Structural analysis of particulate suspensions under simple shear flow¹ KYUNG AHN, Seoul National University, SUNJIN SONG, SEUNG LEE — A new simulation platform that takes the interaction between fluid and particle has been developed. We analyzed three-dimensional microstructures of repulsive and weakly aggregating suspensions under simple shear flow. Two-dimensional Fourier Transform of the particle images and pair distribution functions were used for microstructure analysis. Particles are well aligned in repulsive suspension while there is an anisotropic configuration of particle clusters in weakly aggregating suspension. We could observe a vorticity-directional motion even in a simple shear flow for aggregating particle suspension, which was recently reported by scattering techniques. Helical motion towards the vorticity direction appears because the flow field is disturbed by the extra stress of the particles. High local shear rate regime is also observed near the fast helical streamlines. This result will provide a clear outlook for the simple shear flow of particulate suspensions.

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