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Radial distribution of neutrally buoyant spherical particles suspended in Poiseuille flow YUSUKE MORITA, TOMOAKI ITANO, MASAKO SUGIHARA-SEKI, Kansai Univ. — An experimental study of the inertial migration of neutrally buoyant spherical particles suspended in the Poiseuille flow through circular tubes has been conducted at Reynolds numbers (Re) from 100 to 1000. The distributions of particles at downstream cross-sections were measured and the probability density function (PDF) of particles was calculated as a function of the radial position. At relatively high Re , the PDF was found to have two peaks, corresponding to the so-called Segre-Silberberg annulus and the inner annulus, whereas at low Re only the Segre-Silberberg annulus was present. As the measurement sites got downstream, the fraction of the particles observed on the inner annulus decreased and its radial position moved outward towards the Segre-Silberberg annulus. These results suggest that, if the tubes were long enough, the inner annulus would disappear, so that only the Segre-Silberberg annulus would be present.

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