

Inertial Migration of Rigid Spherical Particles in Poiseuille Flow

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A neutrally buoyant particle in pipe flow is known to undergo a radial migration for finite Reynolds number flows. This effect was first observed by Segre and Silberberg, who noted a radial equilibrium position at a radius $r=0.6R$ in a pipe of radius R , in conditions of finite but low Re . These results have been extended to show that the equilibrium position of the particles is moved toward the wall as Re increases. Moreover a new equilibrium position closer to the center was observed to become dominant at elevated Re . A comparison with asymptotic theories is provided.

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