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Density Stratification of Rotating Flow in Coaxial Cylinder SUNGSU LEE, HYUN AH SON, Chungbuk National University, ALBERT S. KIM, University of Hawaii at Manoa — Flows containing particulates often pose problems in many engineering practices among which the separation of clean water from polluted solution is essential in environmental engineering. In this study, the stratification of density in a coaxial cylinder are investigated using computational fluid dynamics with Boussinesq approximation. Particulate flow is injected into the domain between the vertical coaxial cylinders and allowed to leave the domain through the exit located upper part of the inner cylinder. During the rotation initiated by the tangential momentum, the hydrodynamic forces stratifies the particulate flow and interact with gravitational force as well as friction, which make the flow instable and complex. This study includes parametric investigation by varying the density of the particulates in the flow and the size of the inner cylinder. The results will present the effectiveness of the stratification which corresponds to the vortex separation in many engineering practice. This work was financially supported by projects of the "Development of Energy utilization technology with Deep Ocean Water," KIOST of Korea.

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