

Abstract Submitted
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Twisted wake of a sphere in rotating fluid TAKAHIRO YOSHIMOTO, Hokkaido University, JOZEF VLASKAMP, MARK BREND, PETER THOMAS, University of Warwick, YUICHI MURAI, YASUSHI TAKEDA, Hokkaido University — The Taylor-Proudman theorem has simple and interesting consequences, illustrating the fact that rotating fluids exhibit a range of phenomena not found in non-rotating fluids. The principal phenomenon of these is the formation of Taylor Columns. The phenomena occur if there are relative motions between a flow in a strongly rotating system and an obstacle in the flow. In our research, effect of the background rotation on the wake of flow past a solid sphere has been studied experimentally. The sphere is hung in a rotating tank filled with water. While the sphere is towed along the centre line of the rotation, the wake region was chased with a digital video camera and a light sheet that illuminates the area. The experiments were performed in various range of the Rossby number. The visualization from the same inertia frame yields striking results. Twisting columnar flow, which looks quite similar to Taylor Column, visualized in the wake of a sphere in rotating fluid. Taking PTV (Particle Tracking Velocimetry) analysis, velocity fields of the flow were obtained. With the help of the results, discussions about the development of the twisted columnar flow and its structure will have been taken place in the conference.

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