

Abstract Submitted
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First instabilities of the wake behind a rotating sphere JOSE EDUARDO WESFREID, PMMH (ESPCI-CNRS) Paris, France, MACIEJ SKARYSZ, Warsaw University of Technology, Faculty of Power and Aeronautical Eng., SOPHIE GOUJON-DURAND, PMMH (ESPCI-CNRS) Paris, France, JACEK ROKICKI, Warsaw University of Technology, Faculty of Power and Aeronautical Eng. — The wake behind a sphere, rotating about an axis aligned with the streamwise direction, has been experimentally investigated in a water tunnel using LIF visualizations and PIV measurements. The measurements focused on the evolution of the flow regimes that appears depending of two control parameters, namely the Reynolds number Re and the dimensionless rotation or swirl rate Ω which is the ratio of the maximum azimuthal velocity of the body to the free stream velocity. In the present investigation, we covers the range of Re smaller than 400 and Ω from 0 and 1.5 . Different wakes regimes such as an axisymmetric base flow, a low frequency frozen state, and an single and double helicoidal mode are represented in the (Re, Ω) parameter plane.

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