Orientational considerations in fluid structure interaction

Ashwin Vaidya & Bong Jae Chung
Department of Mathematics
University of North Carolina at Chapel Hill, USA
avaidya@email.unc.edu, bjchung@email.unc.edu

Abstract

The interaction of fluids with structures has given rise to very interesting mathematical and physical problems. One such problem concerns the orientation of bodies moving in fluids. Experiments show that the attitude that a particle assumes when immersed in a fluid depends upon the material properties of the fluid as well as the shape of the body. As the inertial effects in the fluid increase, vortex shedding in the wake of the body gives rise to some very interesting dynamics. In this talk we present an overview of some experimental, numerical and theoretical work that we have done and is in progress regarding this problem. We also briefly discuss an extremum principle that governs the interaction behavior based upon the laws of non-equilibrium thermodynamics.

Keywords: Fluid-structure interaction, orientation, vortex shedding.

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