UNIVERSITY of HOUSTON

Department of Mathematics

Scientific Computing Seminar

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Spectral Analysis of High-fidelity Wall-Bounded Turbulence Simulations

Thursday, March 7, 2024 1 PM- 2 PM Room 646 PGH

Abstract: Nearly all moving objects on Earth pass through fluids, and many of them move at high speed. This makes high Reynolds Number (Re) wall-bounded turbulent flows of great technological importance. High spatial and temporal resolution is required to study these flows due to the multi-scale nature of turbulence. Direct numerical simulation (DNS) is a technique in which the Navier-Stokes equations, the governing equations of fluid flow, are solved with sufficient resolution to represent all scales of turbulence. Therefore, DNS is very expensive and always limited by computational capabilities. DNS of incompressible turbulent channel flow at friction Reynolds numbers Re_{τ} up to 5200 have been performed with more than 500,000 processors to study high Re wall-bounded turbulence. In this presentation, we will discuss the characteristics of high Re wall-bounded flows with simulation results from turbulent Poiseuille and Couette flows.

This seminar is easily accessible to persons with disabilities. For more information or for assistance, please contact the Mathematics Department at 743-3500.