Abstract Submitted
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Modulation of energetic coherent motions by large-scale topography. WING LAI, TSI Incorporated, ALI M. HAMED, University of Illinois at Urbana-Champaign, DAN TROOLIN, TSI Incorporated, LEONARDO P. CHAMORRO, University of Illinois at Urbana-Champaign — The distinctive characteristics and dynamics of the large-scale coherent motions induced over 2D and 3D large-scale wavy walls were explored experimentally with time-resolved volumetric PIV, and selected wall-normal high-resolution stereo PIV in a refractive-index-matching channel. The 2D wall consists of a sinusoidal wave in the streamwise direction with amplitude to wavelength ratio $a/\lambda x = 0.05$, while the 3D wall has an additional wave in the spanwise direction with $a/\lambda y = 0.1$. The ?ow was characterized at Re ˜8000, based on the bulk velocity and the channel half height. The walls are such that the amplitude to boundary layer thickness ratio is $a/\delta 99 \approx 0.1$, which resemble geophysical-like topography. Insight on the dynamics of the coherent motions, Reynolds stress and spatial interaction of sweep and ejection events will be discussed in terms of the wall topography modulation.

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