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Coherent structures in homogeneous shear turbulence compared with those in channels[1] SIWEI DONG, ADRIÁN LOZANO-DURÁN, ATSUSHI SEKIMOTO, JAVIER JIMÉNEZ, Universidad Politécnica de Madrid — Three-dimensional vortex clusters and coherent structures responsible for the momentum transfer (Qs) are studied by DNS in homogeneous shear turbulence (HST) at $Re_\lambda =$ 50, 100 and 250, with emphasis on comparisons with channel turbulence (CH). The anisotropic orientation of those structures only appears for volumes larger than L_c^3 (L_c is the Corrsin scale). Even in that case, their anisotropy is moderate, similar to the detached structures in the CH. Only strictly attached structures in channels are more anisotropic. The Reynolds stress contained in vortex clusters is mainly associated with Q^-s, distributed equally between sweeps (Q4) and ejections (Q2), instead of preferentially with the latter, as in the CH. The average fractal dimension of Qs is roughly 2.1 and that of vortex clusters is 1.8. The relative positions of the structures reveal that they form streamwise trains of groups of a Q2 and a Q4, paired side-by-side in the spanwise direction, with vortex clusters in between, as in the CH.

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