

Abstract Submitted
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Characterization of linear-like Orr bursts in fully turbulent channel flows¹ MIGUEL P. ENCINAR, JAVIER JIMENEZ, Technical University of Madrid — The linearised Orr-Sommerfeld equation predicts that initially small perturbations of the cross-shear velocity become transiently amplified when tilted by the effect of a mean shear. Such transient behaviour can also be found in the large-scale structures of fully developed nonlinear shear turbulence, although affected by the non linearity of the flow. We investigate the dynamics of the bursting structures in properly filtered large-box turbulent channels at $Re_\tau = 950$, and find that all velocity components play an important role in their formation. This implies that their underlying geometry is three dimensional. We explore the latter using spatio-temporal conditionally averaged structures that show the formation of tilted rollers at the moment of the burst, and reveal a relation between the Orr-like bursts and the vertical momentum transfer.

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