Abstract Submitted
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The structures of the momentum transfer in turbulent channels OSCAR FLORES[1], JAVIER JIMÉNEZ[2], U. Politecnica Madrid — We analyze the geometry and the spatial distribution of structures with $-uv > 1.75u'v'$, in a turbulent channel with $Re_\tau = 10^3$. Even if they cover less than 10% of the wall-parallel area, they contribute up to 60% of the mean Reynolds stresses. Most of them are wall-attached, forming a self-similar family in which the objects lengths and widths are proportional to their heights. They are classified into Q2 ejections ($v > 0, u < 0$) and Q4 sweeps ($v < 0, u > 0$), usually forming side by side pairs, several (3–4) of which tend to be aligned in the streamwise direction, with a weak tendency for larger objects to be downstream of smaller ones. While the geometric and spatial characteristics of Q2s and Q4s are very similar, the velocity fields conditioned to them show higher log-layer streaks associated with the Q4s. The streak length decreases when conditioned only to isolated objects, suggesting that the observed very long streaks are due to the streamwise grouping of the pairs. A special class is formed by events with heights of the order of the channel half-width, with "packets lengths" of the order of the full simulation domain ($25h$). Funded by CICYT.

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