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Effects of resolution on the fine scale features in the far field of a turbulent planar mixing layer OLIVER BUXTON, SYLVAIN LARDEAU, SYLVAIN LAIZET, BHARATHRAM GANAPATHISUBRAMANI, Imperial College London — The three-dimensional structure and behaviour of the rate of rotation and strain rate tensors is examined in the far field of a turbulent planar two dimensional mixing layer. The mixing layer is simulated using the incompact3d DNS code at Reynolds number based on inlet conditions of 1000. The study looks at the effect of spatial resolution on the length scales of strain dominated (dissipation) and rotation dominated (enstrophy) regions of the flow by filtering the data and interpolating it onto successively coarser grids. The length scales of these regions are observed by means of probability density functions and the topological evolution is characterised by the intermediate eigenvalue of the rate of strain tensor. Additionally, the structure and length scales of strain producing and enstrophy producing regions of the flow, and the effects of spatial resolution upon them, are investigated. The effects of spatial resolution upon the interaction between strain and rotation are observed by looking at the alignment angle between the vorticity vector and the eigenvectors of the strain rate tensor.

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