5. Visualization of the Turbulent Jet with Two-dimensional Discrete Wavelet Transform

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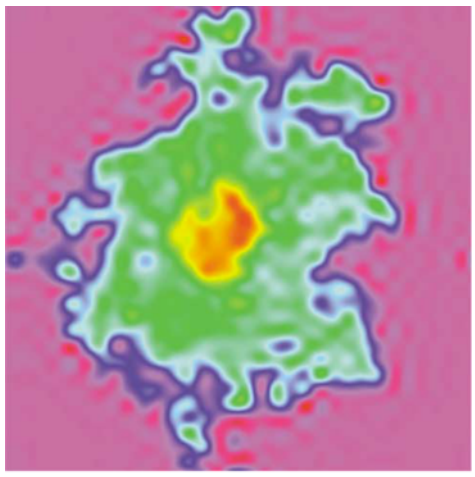
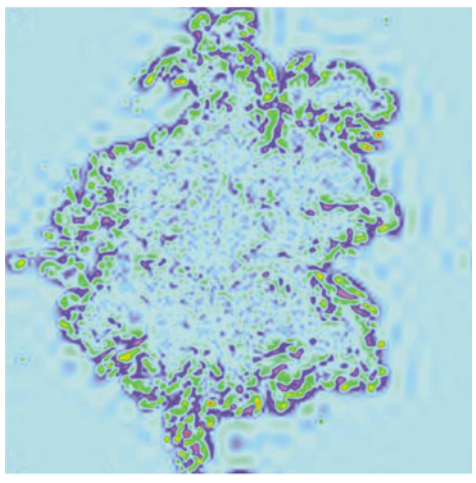
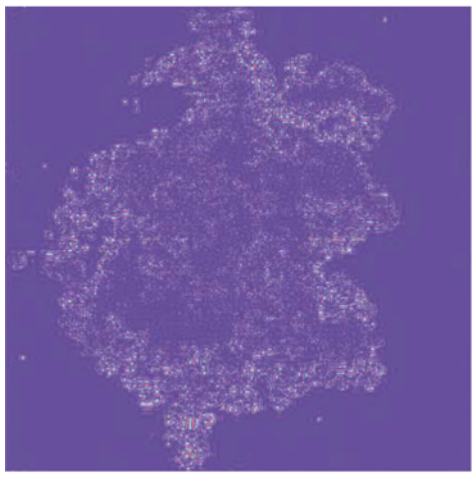


Scale 19~56 mm



Scale 5~19 mm



Scale 1~5 mm

The photographs show the multiresolution structure of a turbulent jet slice in far field (z/d=275) at Re=18$\times$10^3, which is obtained by decomposing the experimental image of the jet-fluid concentration with two-dimensional discrete wavelet transform with help of Daubechies' orthonormal wavelet bases of N=20. In these photographs, the highest concentration is displayed as a deep red and the lowest as purple. Blue in each signifies the zero value. These photographs provide further evidences of multi-scale structures in a turbulent jet, and show three ranges of important scales that dominate the energy-containing structure in the range of $\lambda \cong$ 19~56 mm, the turbulent mixing process in the shear layer with $\lambda \cong$ 5~19 mm and the smaller-scale structure at $\lambda \cong$ 1~5 mm, respectively.