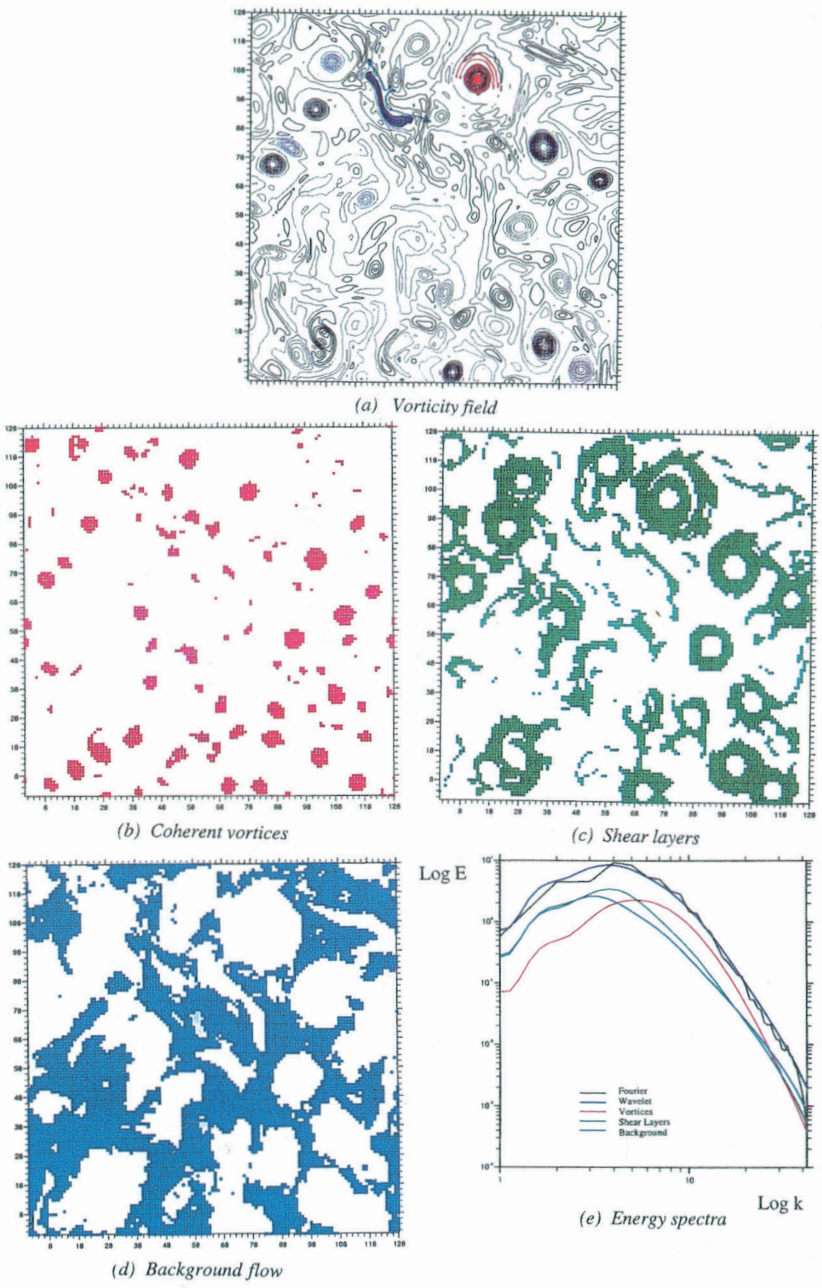

Plate 4.2 Conditional wavelet spectra (this computation was done in collaboration with Thierry Philipovitch). (a) Vorticity field. In red: elliptic regions, dominated by rotation (antisymmetric part of the stress tensor $\nabla \boldsymbol{v}$), which correspond to the coherent vortices. In blue: hyperbolic regions, dominated by strain (symmetric part of the stress tensor $\nabla \boldsymbol{v}$), which correspond to the incoherent background flow. (b) Coherent vortices where rotation dominates. (c) Shear layers where strain and strong velocity dominate. (d) Background flow where strain and weak velocity dominate. (e) Energy spectrum. In black: Fourier energy spectrum, which tends to scale as $k^{-4.5}$ in the inertial range. In dark blue: wavelet energy spectrum, which is a smooth approximation of the Fourier spectrum and tends to scale as $k^{-4.5}$. In red: wavelet energy spectrum of the coherent vortices, which tends to scale as k^{-5}. In green: wavelet energy spectrum of the shear layers, which tends to scale as k^{-4}. In light blue: wavelet energy spectrum of the background flow, which tends to scale as k^{-3}.

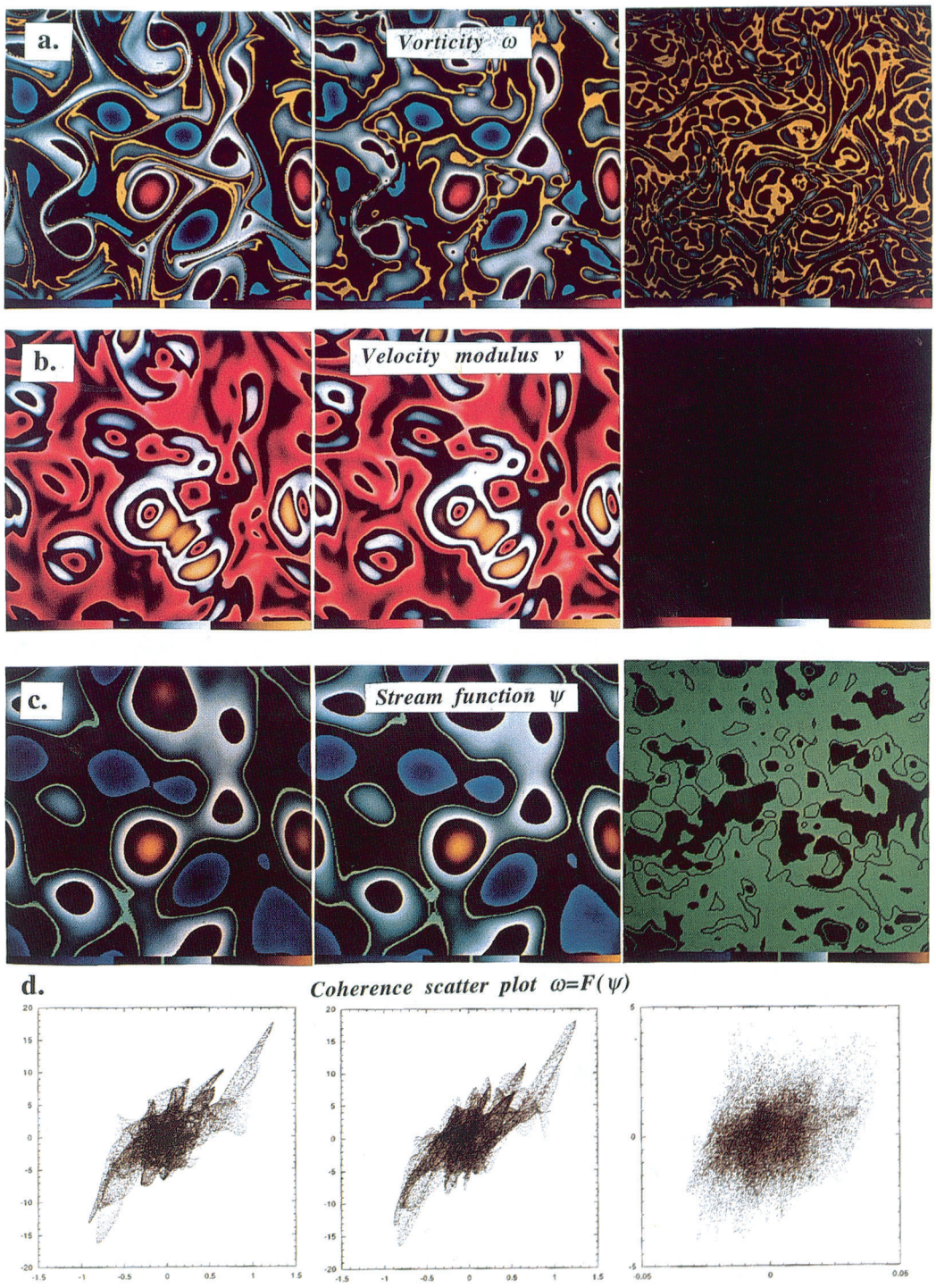

Plate 4.3a–d Wavelet compression of vorticity. (a) The vorticity. (b) The modulus of velocity. (c) The streamfunction. (d) The coherence scatter plot.