Topologically Coherent and Topologically Stationary Flows Far from Equilibrium

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The atmosphere and the ocean often support long-lived, topologically coherent and topologically stationary, evolutionary flows far from thermodynamic equilibrium. These non-equilibrium flows, surprisingly, are dominated by a Bernoulli-Hamiltonian component which is "stationary", or long lived, in a topological sense. The Bernoulli-Hamiltonian component is an artifact of a 2+1=3D Contact (topological) manifold. Fluctuations about the stationary Bernoulli-Hamiltonian component can be described by Macroscopic Spinors associated with fluid rotations, and which are artifacts of 4D Symplectic manifolds and irreversible thermodynamic processes. Macroscopic Spinor solutions (complex direction fields with zero length) have been more or less ignored by hydrodynamicists, yet they come in complex conjugate pairs that represent mininal surfaces which can be put into correspondence with hydrodynamic wakes.