

Evolution of topology in axi-symmetric and 3-d viscous flows

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Abstract

Topological methods are used to establish global and to extract local structure properties of vector fields in axi-symmetric and 3-d flows as function of time. The notion of topological skeleton is applied to the interpretation of vector fields generated numerically by the Navier-Stokes equations. The flows considered are swirling jets with super-critical swirl numbers that show low Reynolds number turbulence in the break-up region.