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A quantitative description of turbulence

In Kolmogorov's theory of turbulence, the fluid velocity remains continuous in the inviscid limit, implying a mild vorticity divergence, though over a nonzero volume of fluid. Furthermore, the velocity associated with the vortices carrying diverging vorticity vanishes. This precludes certain forms of singularities. For example, vortex tubes would not collapse in straightforward ways as to render a dual divergence of velocity and vorticity (or a divergence of vorticity alone with the associated velocity remaining nonzero).

This talk discusses the Kolmogorov picture and explores ways to describe some of its features in quantitative terms.