

Necessary and sufficient conditions for K41 theory

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Kolmogorov's 1941 Theory (aka K41 theory) is one of the main theories of incompressible fluid turbulence. His theory posits that there is a linear transport of kinetic energy from large scales where it is injected to small scales where it can be dissipated. This has been confirmed by many numerical and physical experiments becoming the "first exact law of fluid turbulence" and yet the original (statistical) assumptions used to conjecture that linear rate of transport are in general false. In this talk, I will briefly discuss how the true conditions of Kolmogorov's theory of turbulence are actually in terms of the regularity class of the limiting inviscid solution.