

Abstract Submitted
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Statistically non-stationary turbulence¹ WILLIAM K. GEORGE, Imperial College of Science, Technology and Medicine — Of all the assumptions in Kolmogorov 1941 the most fundamental is the assumption (or postulate) that the smallest scales of the turbulence are in statistical equilibrium. This is usually justified by heuristic arguments based on the decreasing time scales as the eddy size is decreased relative to that of the energy containing eddies so that they can be assumed to be in *local equilibrium*. This argument can be shown to be fundamentally flawed since it does not account for the decreasing energy of the smaller scales. Moreover there are well-documented counter-examples to local equilibrium in non-stationary flows. It will be suggested that the K41 scaling arguments (or variations upon it) for the dissipative scales are in fact only applicable to flows in strict statistical equilibrium (i.e., statistically stationary), and should not be expected to apply to non-equilibrium flows. At least three types of non-equilibrium flows will be identified, one of which curiously enough satisfies Kolmogorov scaling at all scales.

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