

Abstract Submitted
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The emergence of correlations from distant sources in turbulent flows MIHKEL KREE, IRPHE, Aix Marseille Universite, JÉRÔME DUPLAT, Université Joseph Fourier, Grenoble, EMMANUEL VILLERMAUX, Aix Marseille Université — A scalar field injected from a point source in a turbulent flow resolves into a set of elongated sheet-like structures whose concentration probability distribution $P(C)$ is well understood in terms of the interplay between stretching histories of fluid particles, and molecular diffusion. Additionally, neighboring sheets may diffusively merge and evolve further in an undistinguishable fashion. We report here on experiments using two distinct dyes (Fluorescein and Rhodamine in water) injected from sources separated by a variable distance s in a turbulent jet. This method allows to separate the total concentration field C into its subparts C_1 and C_2 originating from each sources. Joint probability distributions $Q(C_1, C_2)$ and correlations between the fields can thus be measured. We evidence this way the crossover scale above which the fields are and remain independent in the flow.

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