

Abstract Submitted
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Is a randomly stirred mixture a maximum entropy object? EM-MANUEL VILLERMAUX, IRPHÉ, Marseille, JÉRÔME DUPLAT, IUSTI, Marseille — A randomly stirred scalar mixture can be viewed as a set of adjacent stretched sheets, merging diffusively into each other. For a mixture decaying at fixed stirring intensity and average concentration, the consequences of this vision offer a precise description of the shape and evolution of the concentration Probability Density Function [PRL 91 (18), 184501, (2003)]. Because of the aggregation between nearby sheets, the concentration field is defined on a naturally coarse grained scale η incorporating many independent merged sheets. There is obviously a number of ways to realize a given macroscopic concentration distribution by assembling elementary sheets into independent boxes of size η . From the inventory of the number of microscopic states, we derive the corresponding entropy, and show that real mixtures *do not* maximize entropy. Real and maximum entropy distributions are however close in shape and evolution, and both consistently lead to the same value of the entropy at complete mixing.

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