

Abstract Submitted
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Mixing in sheared suspensions REGIS TURUBAN, HENRI LHUISSIER, BLOEN METZGER, IUSTI CNRS UMR 7343 Marseille France, GEP TEAM — Mixing occurs spontaneously in sheared suspensions even at low Reynolds number. The presence of particles induces disorder which lead to exponential elongations within the fluid: concentration levels thus quickly spread and decay. We experimentally characterize the evolution of the concentration PDFs of a blob of fluorescent dye initially injected in an index-matched suspension. High precision optical imaging technics reveal for the first time the finest spatial details of the concentration field possibly generated by this chaotic flow (Batchelor scales). We find that at short times, the evolution of the concentration PDFs are correctly predicted by a model based solely on the stretching kinematics. At longer times, we show that to predict the experimental observations, the model should also include the effect of coalescence between adjacent lamellae of dye.

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