

Abstract Submitted
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Dispersion and stretching in 3D Porous media BLOEN METZGER, Aix-Marseille University, IUSTI-CNRS UMR 7343, 13453 Marseille, France, MATHIEU SOUZY, YVES MEHEUST, TANGUY LE BORGNE, Geosciences Rennes, UMR 6118 University of Rennes 1 CNRS 35042 Rennes France, HENRI LHUISSIER, Aix-Marseille University, IUSTI-CNRS UMR 7343, 13453 Marseille, France, GEP TEAM, OSUR TEAM — Mixing processes in complex flows are governed by the dispersion and stretching induced by the flow in question. However, even for the apparently simple case of a viscous flow through an isotropic porous medium, the statistics of these crucial kinematics quantities remain uncertain. We experimentally tackle this problem using an index-matched porous medium composed of randomly packed solid spheres. The 3D Eulerian velocity-field is characterized with an unprecedented resolution. The dispersion of advective particles is measured and explained in terms of the velocity statistics. Last, the stretching laws are measured for the first time using a Lagrangian stretching reconstruction method. These results provide solid grounds for a full description of mixing processes in porous media.

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