Abstract Submitted
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Multiscale geometrical Lagrangian statistics: scale-dependent curvature and torsion angles in particle-laden turbulent flows[1] KAI SCHNEIDER, I2M-CNRS, Centre de Mathématiques et d'Informatique, Aix-Marseille Université, Marseille, France, BENJAMIN KADOCH, IUSTI-CNRS, Aix-Marseille Universite, Marseille, France, MAXIME BASSENNE, MAHDI ESMAILY-MOGHADAM, Center for Turbulence Research, Stanford University, Stanford, CA, USA, MARIE FARGE, LMD-IPSL-CNRS, Ecole Normale Supérieure, Paris, France, WOUTER BOS, LMFA-CNRS, Ecole Centrale de Lyon, Université de Lyon, Ecully, France — We present multiscale statistics of particle trajectories in isotropic turbulence and compare the behaviour of fluid and inertial particles. The directional change of inertial particles is quantified by considering the curvature angle for different time increments. Distinct scaling behaviors of the mean angle are observed for short, intermediate and long time lags. We also introduce the scale-dependent torsion angle, which quantifies the directional change of particles moving out of the plane. The influence of the Stokes and Reynolds numbers on the mean angles and on the probability distributions are analyzed. Finally, we assess the impact of LES and particle SGS modeling on those statistics.

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