Abstract Submitted
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The motion of spherical particles falling in a cellular flow field[1]
ELISABETH GUAZZELLI, GILLES BOUCHET, LAURENCE BERGOUGNOUX, Aix-Marseille Univ., CNRS, IUSTI UMR 7343, GEP TEAM — The objective of the present study is to understand the influence of turbulence on the settling of particles under the action of gravity. This effect is intimately related to the interactions of particles with local spatial structures of the flow, e.g. large vortices. These vortical structures have a significant effect on the local particle transport and concentration. We present a jointed experimental and numerical study to examine these issues. The two-dimensional model experiment uses electroconvection to generate a two-dimensional arrays of controlled vortices which mimic a simplified turbulent flow. Particle image-velocimetry or tracking are used to examine the motion of the particles within this vortical flow. The numerical simulation is inspired by the model developed by Maxey (Phys. Fluids 30, 1915, 1987).

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Elisabeth Guazzelli
Aix-Marseille Univ., CNRS, IUSTI UMR 7343

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