

Abstract Submitted
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Chaotic mixing in vortex-dominated flows¹ MARK KINGSBURY,
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chaotic mixing in time-periodic, two-dimensional (2D) arrays of vortices. The flows
are formed from the superposition of two vortex arrays shifted by half a vortex
width in both directions. Flows generated by this method show both diffusive and
superdiffusive transport, depending on the relative strengths and nature of the time
dependence of the currents producing the two vortex arrays. Experimentally, we
track the motion of tracer particles moving with the flow. From these tracks, we
can determine the growth of the variance of a distribution of tracers. We are also
applying algorithms based on braiding analysis ² to determine the topological en-
tropy for mixing in these flows. We are also initiating studies of chaotic mixing in a
3D, time-independent flow (composed of nested vortices) with the goal of studying
advection-reaction-diffusion processes in a 3D system.

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²J.-L. Thiffeault, preprint

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