

Abstract Submitted
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Mixing in a translating drop in the presence of modulated electric field DMITRI VAINCHTEIN, Temple University, THOMAS WARD, University of California, Los Angeles — We study chaotic advection and mixing in a drop translating in the presence of an electric field. The flow is a combination of a Hadamard-Rybczynski and a Taylor circulation due to the steady translation and periodically modulated electric field. We consider small perturbations in time and space to what is otherwise an integrable flow. Using a technique introduced by Neishtadt we find an adiabatic invariant for the system by averaging the equations of motion. The chaotic advection is due to quasi-random jumps of the AI after crossing the separatrix of the unperturbed flow. We derive analytical expressions to quantify the change in the AI during a single crossing and compare the results with numerical simulations.

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