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Characterizing transport with local perturbations and Lagrangian trajectories in two-dimensional plasma turbulence DOUGLAS OGATA, DAVID NEWMAN, University of Alaska Fairbanks, RAUL SANCHEZ, JOSE-MIGUEL REYNOLDS-BARREDO, Universidad Carlos III — Perturbative experiments such as pellet injections, gas puffs, heats pulses have been used to investigate the transport characteristics in hot plasmas where probes are not suitable. However, the addition of too large a perturbation can alter the local transport characteristics making it a poor measure of the underlying transport. This work attempts to evaluate both the impact of different sized local perturbations on transport characteristics and the evolution of that perturbation as a measure of transport within a general non-diffusive transport framework. This is done by comparing the evolution of the local perturbation profile and the advection of a passive scalar with the transport characteristics extracted from the Lagrangian trajectories in a two-dimensional electrostatic plasma fluid turbulence model. This work presents the methodology and preliminary comparisons between the trajectories analysis and the evolution of a profile perturbation in order to find experimentally feasible observables to characterize the transport dynamics.

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