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Characterizing Branched Flow BYRON DRURY, Massachusetts Institute of Technology, ANNA KLALES, ERIC HELLER, Harvard University — Branched flow appears in a variety of physical systems spanning length scales from microns to thousands of kilometers. For instance, it plays an important role in both electron transport in two dimensional electron gases and the propagation of tsunamis in the ocean. Branches have typically been identified with caustics in the theoretical literature, but concentrations of flux recognizable as branches can arise from other mechanisms. We propose a generalized definition of branching based on a local measure of the stability of trajectories. We analytically and numerically study the characteristics of Hamiltonian flow in phase space and characterize the relationship between branch formation and trajectory stability.

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