Abstract Submitted
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Laboratory experimental investigations of braid theory using the rotor-oscillator flow MARGAUX FILIPPI, SÉVERINE ATIS, Massachusetts Inst of Tech-MIT, MICHAEL ALLSHOUSE, University of Texas - Austin, GUSTAAF JACOBS, San Diego State University, MARKO BUDIŠIĆ, JEAN-LUC THIFFEAULT, University of Wisconsin - Madison, THOMAS PEACOCK, Massachusetts Inst of Tech-MIT — Interpreting ocean surface dynamics is crucial to many areas of oceanography, ranging from marine ecology to pollution management. Motivated by this, we investigated the braid theory method to detect transport barriers bounding coherent structures in two-dimensional flows. Whereas most existing techniques rely on an extensive spatiotemporal knowledge of the flow field, we sought to identify these structures from sparse data sets involving trajectories of a few tracer particles in a two-dimensional flow. We present the results from our laboratory experiments, which were based on investigations using the rotor-oscillator flow, as a stepping stone towards oceanic applications.

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