

Abstract Submitted  
for the DFD08 Meeting of  
The American Physical Society

Sorting Category: 05. (T)

**Unmixed islands in quasi-periodically-driven flows<sup>1</sup>**

HOPE WEISS, ANDREW SZERI, UC Berkeley — Nested invariant 3-tori surrounding a torus braid of elliptic type are found to exist in a quasi-periodically forced fluid flow. The Hamiltonian describing this system is given by the superposition of two steady stream functions, one with an elliptic fixed point and the other with a coincident hyperbolic fixed point. The superposition, modulated by two incommensurate frequencies, yields an elliptic torus braid at the location of the fixed point. The system is suspended in a four-dimensional phase space (two space and two phase directions). To analyze this system we define two three-dimensional, global, Poincaré sections of the flow. The coherent structures (cross-sections of nested 2-tori) are found to each have a fractal dimension of two, in each Poincaré cross-section. This framework has applications to tidal and other mixing problems of geophysical interest.

<sup>1</sup>Research supported by NSF.

- Prefer Oral Session  
 Prefer Poster Session

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Date submitted: 04 Aug 2008

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