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**Adam M Fox\*** ([adam.fox@colorado.edu](mailto:adam.fox@colorado.edu)). *Greene's Criterion for the Breakup of Invariant Tori of Volume Preserving Maps.*

Invariant tori play a prominent role in the dynamics of symplectic maps. These tori are especially important in two dimensional systems where they form a boundary to transport. Volume preserving maps also admit families of invariant rotational tori, which will restrict transport in a  $d$  dimensional map with one action and  $d-1$  angles. These maps most commonly arise in the study of incompressible fluid flows, however can also be used to model magnetic field-line flows, granular mixing, and the perturbed motion of comets in near-parabolic orbits. Although a wealth of theory has been developed describing tori in symplectic maps, little of this theory extends to the volume preserving case. In this talk we will explore the invariant tori of a 3 dimensional quadratic, volume preserving map with one action and two angles. A method will be presented for determining when an invariant torus with a given frequency is destroyed under perturbation, based on the stability of approximating periodic orbits. (Received September 25, 2012)