

Abstract Submitted
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On Liouville's theorem in fluid mechanics P.J. MORRISON, The University of Texas at Austin, F. BOUCHET, (CNRS) ENS-Lyon, France, S. THALABARD, ENS-Lyon, France, O.V. ZABORONSKI, University of Warwick, Coventry, UK — Since the early work of Burgers it has been known that discretizations of fluid models possess a version of Liouville's theorem on conservation of phase space volume. In fact, spectral representations of two-dimensional turbulence are known to have a detailed version of this theorem. The existence of such Liouville theorems led many (e.g. Burgers, Lee, Kraichnan and Montgomery) to consider various statistical mechanical approaches to turbulence. We show how this theorem arises naturally from the Hamiltonian structure of inviscid fluid equations.

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