Statistical mechanics of Vlasov continua[1] P.J. MORRISON, University of Texas at Austin — Ideas of statistical mechanics have been applied to describe the turbulence of continuum systems, such as those described by the Vlasov and two-dimensional Euler equations, since the early work of Burgers, Onsager, Lee, Lynden-Bell, Kraichnan, Montgomery, and others. Results using two new approaches for calculating the partition function and obtaining turbulent spectra will be discussed. The first is based on the use of normal coordinates associated with continuum eigenfunctions, which are used in the manner of particle degrees of freedom for finite systems. The second is based on an experimentally verifiable definition of independent subsystems and concomitant independent invariants. Appropriate additive invariants are use in the calculation of the partition function. Regions of validity of the two approaches will be discussed.

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