1085-00-257 **Vladimir Zakharov*** (zakharov@math.arizona.edu), Department of Mathematics, University of Arizona, Tucson, AZ 85721-0089. *Turbulence in Integrable Systems.*

Nonlinear wave systems integrable by Inverse Scattering Method (ISM) could demonstrate a complex behavior that demands the statistical description. The theory of this description composes a new chapter in the theory of wave turbulence - Turbulence in Integrable Systems. All systems integrable by ISM are separated in two classes: strongly and weakly integrable. Systems of both classes have infinite array of motion constants but only for strongly integrable systems this array is complete. As a result, the scattering is trivial in these systems. It means that all the collision terms in kinetic equations of arbitrary high order are identically zero. The examples of strongly integrable systems are: KdV, NLSE and KP-2 equations. In strongly integrable systems one can choose as initial data a statistically homogenous random field with a given pair correlation function such that this function is invariant in time. The spatial spectrum of an equilibrium state can be chosen in an arbitrary way. In weakly integrable systems (KP-1, three-wave system, etc) the kinetic equations are non-trivial. (Received September 11, 2012)