

On nonlinear evolution of Alfvénic turbulence in low beta plasmas

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Nonlinear evolution of broadband spectrum Alfvénic turbulence is studied by using one-dimensional hybrid simulations. Numerical solutions indicate that important characteristics of solar wind MHD turbulence are naturally reproduced by the nonlinear evolution of Alfvénic turbulence represented by a more realistic power spectrum than those used in past studies. Namely, (i) the modulational instability can dissipate the magnetic energy of Alfvénic turbulence and preserve the Alfvénicity even in low beta plasmas, and (ii) nonlinear evolution of Alfvénic turbulence can induce the generation of the localized structures in solar wind MHD turbulence.