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**Session pThpP1 - Poster Session: Self- Organization, Transport, Turbulence and Chaos.**  
*POSTER session, Thursday afternoon, November 20*  
*South Hall, Convention Center*

## **[pThpP1.25] Scaling of Anisotropic Spectra in Shear-Alfvén Magnetohydrodynamic Turbulence**

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Weak magnetohydrodynamic turbulence in the presence of a uniform magnetic field is dominated by three-wave interactions that mediate the collisions of shear-Alfvén wave packets propagating in opposite directions parallel to the magnetic field. The scaling of three-wave couplings is calculated by asymptotic analysis and a direct numerical evaluation of the nonlinear interaction based on the reduced magnetohydrodynamic equations. It is shown that the assumptions of isotropy as well as local interactions in  $k$ -space, often made in scaling or closure studies, are not valid. A new relation is derived between the spectral index of three-wave coupling and the spectral indices of two random-amplitude wave packets [C.S. Ng and A. Bhattacharjee, *Phys. Plasmas* 4, 605 (1997)]. A  $k^{-3}_{\perp}$  spectrum is then deduced, analogous to that of two-dimensional hydrodynamic turbulence. It is suggested that this spectrum is a possible candidate for the observed spectrum ( $k^{-2.8 \pm 0.3}$ ) in high-latitude ionospheric and magnetospheric turbulence for electric fields with  $k > 1 \text{ km}^{-1}$  [P. Kintner, *J. Geophys. Res.* 81, 5114 (1976)].

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