Abstract Submitted
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The Effect of Magnetic Turbulence Energy Spectra on the Heating of the Solar Wind[1] C.S. NG, Geophysical Institute, University of Alaska Fairbanks, A. BHATTACHARJEE, P.A. ISENBERG, D. MUNSI, C.W. SMITH, Space Science Center, University of New Hampshire — Recently, a phenomenological solar wind heating model based on a turbulent energy cascade prescribed by the Kolmogorov theory has produced reasonably good agreement with observations on proton temperatures out to distances around 70 AU, provided the effect of turbulence generation due to pickup ions is included in the model. In the present study, we have incorporated in the heating model the energy cascade rate based on Iroshnikov-Kraichnan (IK) scaling, derivable from incompressible magnetohydrodynamics. We show that the IK cascade rate can also produce good agreement with observations, with or without the inclusion of pickup ions. This effect is confirmed both by integrating the model using average boundary conditions at 1 AU, and by applying a method [Smith et al., Astrophys. J. **638**, 508 (2006)] that uses directly observed values as boundary conditions. These results suggest that if the observed proton heating rates are used to constrain theories of turbulence, there is room in the model to include spectral scalings of magnetic fluctuations varying from IK to Kolmogorov.

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