

Abstract Submitted
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Measurements of the normalized cross-helicity of solar wind turbulence spanning the entire inertial range J.J. PODESTA, Los Alamos National Laboratory, Los Alamos, NM 87545 USA — MHD turbulence which is spatially homogeneous and stationary in time is characterized in part by its three dimensional energy spectrum (Fourier spectrum) and its cross-helicity spectrum. The ratio of the cross-helicity spectrum divided by the energy spectrum is the normalized cross-helicity spectrum σ_c which takes values between -1 and $+1$. Solar wind measurements of the energy spectrum, cross-helicity spectrum, and the normalized cross-helicity spectrum (reduced spectra) have been performed almost since the dawn of the space age 50 years ago. However, measurements of the cross-helicity and the normalized cross-helicity spanning the entire inertial range at 1 AU have only recently been performed for the first time using simultaneous 3-second plasma and magnetic field data from the WIND spacecraft. The new measurements extend the frequency range of previous measurements by 1.5 decades (a factor of ~ 30). A large study of over 100 different intervals of solar wind data shows that the normalized cross-helicity is approximately constant throughout the inertial range and, moreover, that this result holds over a wide range of solar wind conditions including both high- and low-speed wind. This result has important implications for theories of imbalanced MHD turbulence as I show in an accompanying poster.

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