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Magnetohydrodynamic turbulence in the solar polar wind- comparing the last two solar minima.

S. C. Chapman, R. M. Nicol, and E. Leonardis

University of Warwick, Centre for Fusion, Space and Astrophysics, Physics Dept., Coventry CV47AL, United Kingdom (s.c.chapman@warwick.ac.uk)

ULYSSES spacecraft solar polar passes at solar minimum provide in-situ observations of evolving MHD turbulence in the solar wind under ideal conditions of fast quiet flow. The recent unusually inactive solar minimum shows a decrease in the turbulent fluctuations of a factor of two in power in comparison with the previous minimum. We focus on two successive polar passes around the last two solar minima which provide extended intervals of quiet, fast solar wind at a range of radial distances and latitudes: the south polar pass of 1994 and the north polar pass of 1995, and the south polar pass of 2007 and the north polar pass of 2008. We perform statistical analyses of the fluctuating magnetic field observed in- situ by the ULYSSES spacecraft, from the perspective of quantitative characterization of the evolving magnetohydrodynamic (MHD) turbulence. We find a single generalized scaling function characterises this finite range turbulence and is invariant to changes in plasma conditions. If these observations are indeed characteristic of MHD turbulence evolving in- situ, then this quantifies for the first time a key aspect of the universal nature of evolving MHD turbulence in a system of finite size, with implications both for theoretical development, and for our understanding of the evolving solar wind.