

Abstract Submitted
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Spectra and correlations in the solar wind from Voyager 2 around 5 AU LUCA GALLANA, FEDERICO FRATERNALE, MICHELE IOVIENO, Dipartimento di Ingegneria Meccanica e Aerospaziale, Politecnico di Torino, ENRICO MAGLI, SOPHIE FOSSON, Dipartimento di Elettronica, Politecnico di Torino, MERAV OPPER, University of Boston, Astronomy Department, JOHN RICHARDSON, Kavli institute, MIT, DANIELA TORDELLA, Dipartimento di Ingegneria Meccanica e Aerospaziale, Politecnico di Torino — Solar wind spectra deduced from the data recorded by the Voyager 2 mission during 1979 at about 5 astronomical units from the sun are considered. The data are time series which contain voids that typically become larger and irregularly sparse as the craft moves away from the sun (45% missing data in 1979). By extracting complete subsets and filling gaps with different techniques (polynomial interpolation, Rybicki (AJ 1992) and compressed sensing (e.g. Candes et al. CPAM 2006) reconstruction methods, global DFT for irregularly spaced data) we obtain velocity and magnetic field fluctuations between 10^{-5} and 10^{-2} Hz in the MHD inertial range of solar wind. Spectra of all variables show a power law scaling with exponents in between -1.5 and -1.8. PDFs and correlations indicate that the flow has a significant intermittency. The reliability of the reconstruction methods used is analyzed by introducing the same sequence of gaps observed in the Voyager data into a reference dataset extracted from direct numerical simulations of incompressible Navier-Stokes turbulence as well as from synthetic turbulence, and then by comparing the statistics obtained with those of the complete reference dataset.

Daniela Tordella
Dipartimento di Ingegneria Meccanica e Aerospaziale, Politecnico di Torino

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