Turbulence in the Heliosheath: spectral analysis from Voyager 1 and 2 data

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Turbulence in the Heliosheath: spectral analysis from Voyager 1 and 2 data FEDERICO FRATERNALE, LUCA GALLANA, MICHELE IOVIENO, Politecnico di Torino, Dimeas, SOPHIE FOSSON, None, ENRICO MAGLI, Politecnico di Torino, det, MERAV OPHER, None, JOHN RICHARDSON, MIT, Kavli Institute, RACHEL MORGAN, MIT, Aeronautics and Aerospace, DANIELA TORDELLA, Politecnico di Torino, Dimeas — The Voyager 2 spacecraft is traveling through the heliosheath, the outermost layer in heliosphere where the solar wind is slowed by the interstellar gas, while Voyager 1 has entered the local interstellar medium. The they are providing the fist in-situ measurement of plasma and magnetic fields in that regions. We focus on the differences between the energetic particle intensity variations seen by the Voyager 1 and 2 crafts that are crossing the sectored and the unipolar as well as the sectored heliosheath regions, respectively. We try to provide a spectral analysis of the full heliosheath, characterizing the plasma and magnetic field turbulence through the estimate of the spectral properties in the different frequency ranges. Signal reconstruction techniques are mandatory to reconstruct spectra due to extreme data sparsity (up to 97% missings in high resolution data beyond 80 AU). We use three different methods: correlation computation coupled with the maximum likelihood reconstruction, compress sensing and a genetic algorithm to estimate the gap influence on reconstructed spectra. These methods have been previously validated on 1979 data and synthetic hydrodynamics fluid turbulent fields. Results on power density, energy and helicity spectra will

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