Wavelet analysis of low frequency magnetic field fluctuations at the magnetosheath and foreshock regions of the outer planets

Echer, E.

Low frequency magnetic field waves in the magnetosheath and foreshock regions of the outer planet magnetospheres are studied in this work with wavelet analysis. Magnetic field data from Voyager-1 and 2 magnetometers are studied during the flybys of Saturn, Uranus and Neptune. The magnetic field data are 3-sec averaged, and are analysed with the wavelet Morlet transform. This wavelet analysis enables the identification of the main frequencies in the magnetosheath and foreshock regions of the outer planets. Further,the non- stationarity of these waves is investigated, as well as the space dependence in relation to bow shock or magnetopause crossings. Finally, the wave frequencies and properties are compared for the different regions and different planets.

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