A COMPARISON OF THE OCCURRENCE RATE OF SOLAR WIND MAGNETIC HOLES BASED ON VEX AND CLUSTER DATA

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Localised depressions in the magnetic field magnitude, or magnetic holes, are common features in many regions of solar system plasma. It is generally accepted that these magnetic holes are a manifestation of the nonlinear stage of the mirror instability. Two distinct source mechanisms have been proposed for their generation. The first suggests that the holes are generated locally i.e. in the vicinity in which they are observed. The second favours a remote generation mechanism in which the holes are created in the vicinity of the sun and are convected by the solar wind over large distances within the heliosphere. A statistical study of magnetic hole distributions, observed during the same phase of the solar cycle in different regions of the solar system should help to clarify this question. The current work presents the development of a comprehensive, automatic wavelet based methodology for the recognition of magnetic holes. The algorithm has been applied to simultaneous periods of VEX and Cluster data in order to determine the occurrence rate of holes. A comparison of these occurrence rates is discussed and also compared to previous results in other regions of the heliosphere.