



The Heliospheric Magnetic Field through the unusual solar minimum

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The declining phase and the minimum of Solar Cycle 23 (from about 2004) has shown some unusual features when compared to the two previous solar minima for which comparable data are available. The cycle itself appears to be long as sunspots from the new cycle have not appeared in the expected numbers. The open magnetic flux and the solar wind appear to be weaker than during the previous minimum documented by the Ulysses observations. These features are matched by a weaker polar magnetic field and a persistently larger than expected north-south excursion of the coronal magnetic neutral line. We review the heliospheric magnetic field observations made by Ulysses from 2004 to 2008; we report on the open magnetic flux as measured by the normalised radial component of the magnetic field. We examine the structure of the magnetic field and its match with the expected Parker direction. We also review the magnetic field fluctuations, compare them to previous high heliolatitude observations and examine the possible reasons for the observed differences. Finally we present the magnetic field observations in the context of the cosmic ray modulation as observed through the current activity minimum.