

## Solar Wind 10: Abstract #2

### Ulysses observations of Polar Cap magnetic fields in the Maximum and Descending phases of the Solar Cycle

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Ulysses has provided a unique set of observations of the sun's polar cap magnetic fields defined as those originating above  $70^\circ$  heliographic latitude. Above this latitude, Earth and space-based magnetograph measurements become very sparse. At solar minimum, the Ulysses observations produced a measure of the strength of the polar cap magnetic field of about 7 Gauss. The solar wind from the polar cap coronal hole was found to be relatively unstructured although attempts were made to relate what structure was present to polar plumes. Large amplitude outward -propagating Alfvén waves or turbulence were a persistent feature of the solar wind flow. Recent Ulysses observations provide an opportunity to revisit the polar caps when the fields reverse their polarity and gradually grow in strength accompanied by an increase in the area of the polar coronal holes and a decrease in the inclination of the heliospheric current sheet (HCS). Throughout the same interval, limited observations of the polar cap fields by magnetographs, the locations and shapes of coronal holes and the Source Surface Neutral Line (SSNL), customarily associated with the HCS, are available for comparison. The recent observations are occurring during the descending phase of solar activity and are providing an opportunity to follow the growth of the north polar cap field and coronal hole. The set of observations allows several significant scientific questions to be addressed. When did the polarity reversals occur? Was there a delay between the reappearance of the polar cap fields and the time at which they opened into the solar wind? How representative of the HCS is the SSNL when they are both highly inclined? What is the strength of the polar cap field and how does it change with time? How structured is the coronal hole flow and are Alfvén waves still persistent?