ABSTRACT: UCR Astrophysics conference
"Magnetic field and fluctuations in the high latitude solar wind: Solar maximum and minimum"
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The Ulysses spacecraft has now completed surveys of the heliospheric magnetic field from the sun's equator to the poles during both minimum (1993-1997) and maximum (1998-2001) phases of solar activity. During minimum, the structure of the HMF consisted of alternating compression and rarefaction regions and accompanying shocks below 20° - 30° latitude. A relatively smooth field with a single magnetic polarity was found at higher latitudes both north and south on which were superposed large amplitude Alfvén waves and other fluctuations (Directional Discontinuities, Magnetic Holes, Magnetosonic Waves and a general background Turbulence). The Heliosphere exhibited a distinct North-South asymmetry that was evident in simultaneous in-ecliptic data. At solar maximum, observations in the south hemisphere, showed that irregular field structure (compression, rarefactions, coronal Mass Ejections) persisted to the highest latitudes. The Heliospheric Current Sheet separating magnetic sectors was highly inclined and almost reached to the south pole. The magnetic polarity was unchanged from solar minimum. Conditions in the north hemisphere were different. The irregular structure and current sheet extended to about 70° above which the relatively smooth polar cap magnetic fields prevailed with the superposed Alfvén waves and other fluctuations. The polarity of the polar cap had reversed and was now inward. The open magnetic flux turned out to be independent of latitude in both phases.