



## **Observations of the December 2006 particle events at high latitudes with the KET aboard Ulysses**

**B. Heber** (1), A. Struminsky (2), R. Mueller-Mellin (1), R. Gomez-Herrero (1), A. Klassen (1), C. Steigies (1), W. Droege (3), O. Malandraki (4) and R. Marsden (4)

(1) Christian-Albrechts-Universität Kiel, Leibnizstrasse 19, Kiel, D-24118, Germany, (2) Institute of Space Research, Russian Academy of Sciences, Profsoyuznaya Street, 84/32, Moscow 117997, Russia, (3) Institut für Theoretische Physik und Astrophysik, Universität Würzburg, 97074 Würzburg, Germany, (4) Research and Scientific Support Department of ESA, ESTEC, Noordwijk, The Netherlands

An unexpected rise of solar activity close to its minimum in December 2006 resulted in four X-class flares and four energetic particle events. These events were observed close to Earth and above 70 degree South by the Ulysses spacecraft, which was at a heliocentric distance of 2.8 AU at that time. Three out of these four events produced significant intensity increases up to several hundred MeV/nucleon for protons and alpha-particles and several 10 MeV for electrons at high southern latitudes. They were associated with X9.0, X6.5 and X3.4 flares from the AR 10930, coronal type II bursts and strong microwave emission on 5, 6 and 13 December, respectively. The parent solar flares have similar x-ray and microwave time profiles. However, the event on December 13 is the weakest among the three at Ulysses, but it is the largest near Earth. It produced a ground level event leading to an intensity increase of about 34 % in the Kiel neutron monitor. In contrast the December 6 particle event was the largest at Ulysses. We will discuss these events in context of previous Ulysses observations and its consequences for particle propagation to solar polar regions. While we present here the energetic component, the paper by Malandraki et al. will investigate compositional features.