



Energetic particle observations and propagation in the three-dimensional heliosphere during the December 2006 events

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Ulysses is the first spacecraft to fly over the poles of the Sun. Although the Sun was again close to its activity minimum during the recently completed third polar orbit of Ulysses, solar activity has been more prevalent during the declining phase of solar cycle 23 than was the case in the declining phase of the 22nd solar cycle, when the first polar passes occurred (1994-1995). In December 2006, an unexpected rise of solar activity occurred. Active Region 10930 produced a series of major solar flares with the strongest one (X9.0) recorded on December 5, after it rotated into view on the east limb of the Sun. In this work, we present in detail energetic particle observations obtained by various instruments onboard Ulysses, located at > 70 degrees south heliographic latitude during this period and discuss their implications for particle propagation to solar polar regions. The observed events are also compared with high latitudes measurements obtained previously by Ulysses close to solar maximum. Furthermore, comparisons with data acquired by the STEREO and ACE spacecraft near the ecliptic plane are discussed.