

Energetic particle composition measurements by Ulysses obtained during the declining phase of Solar Cycle 23

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We present analyses of energetic particle data measured by the Ulysses spacecraft during the declining phase of the current (23rd) solar cycle. Solar activity has been more prevalent during the declining phase of this cycle than was the case in the declining phase of the 22nd cycle. Ulysses-the first spacecraft ever to fly over the poles of the Sun- has begun its third orbit during the period under study, starting its ascent to high southern heliolatitudes. This phase of the Ulysses mission provides a unique opportunity to study the effects of solar activity from intermediate latitudes and heliocentric distance ~ 5 AU. Energetic particle observations in the 1-20 MeV/nucleon range as measured by the COSPIN/LET instrument onboard Ulysses are reported in the context of the changing state of the heliosphere. We focus, in particular, on the origin of complex particle increases observed at the location of the spacecraft. Composition analysis can provide useful clues in this regard, allowing distinction between particles accelerated in transient events associated with Coronal Mass Ejections (CMEs) (referred to as Solar Energetic Particles, SEPs) and particles accelerated at Stream Interaction Regions (SIRs) or Corotating Interaction Regions (CIRs).