



Energetic particle spectral and compositional invariance in the 3-D Heliosphere: Comparison between Ulysses and ACE/WIND in late 2001

O. E. Malandraki (1), A. J. Tylka (2), C. K. Ng (2,3), R. G. Marsden (4), C. Tranquille (4), D. Patterson (5), T. P. Armstrong (5), L. J. Lanzerotti (6), and G. Dorrian (1)

(1) Institute of Astronomy and Astrophysics, National Observatory of Athens, Athens, Greece (omaland@astro.noa.gr), (2) Naval Research Laboratory, Washington, DC, USA (allan.tylka@nrl.navy.mil), (3) George Mason University, Fairfax, VA, USA (cng@ssd5.nrl.navy.mil), (4) European Space Agency, The Netherlands (richard.marsden@esa.int), (5) Fundamental Technologies Inc., USA (Armstrong@ftecs.com), (6) New Jersey Institute of Technology, USA (ljl@ADM.NJIT.EDU)

Basic research on Space Weather carried out at the Institute of Astronomy and Astrophysics of the National Observatory of Athens within the framework of COMESEP, a collaborative project funded by the Seventh Framework Programme of the European Union is presented in this work. We carry out the first detailed examination and comparison of elemental spectra and composition in the late decay phase of two Solar Energetic Particle (SEP) events in the so-called 'reservoir' regions, between spacecraft widely separated in latitude, as well as in longitude and radial distance in the Heliosphere. Energetic particle data from instruments onboard the Ulysses spacecraft located at a high heliospheric latitude of $\sim 70^\circ$ N and at a heliocentric distance of ~ 2.5 AU and from spacecraft at L1 are used in this work. Particle intensities over time are observed to be in close agreement following the shock passage over the widely separated spacecraft. Electron measurements were used to identify the extent of the particle reservoir. Implications of the observations for models of SEP transport are also discussed. Acknowledgments: The presented work has received funding from the European Union FP7 project COMESEP (263252) and has also been supported by NASA under grants NNH09AK79I and NNX09AU98G (AJT).