**ENERGY SPECTRA OF VERY LARGE GRADUAL SOLAR PARTICLE EVENTS**

A. J. Tylka (1), P. R. Boberg (2,1), C.M. S. Cohen (3), W.F. Dietrich (4), C. G. Maclennan (5), G. M. Mason (6), D. V. Reames(7), R. E. McGuire(7), Chee K. Ng(7,6)
(1) Naval Research Laboratory, (2) Consultant, (3) Caltech (4) University of Chicago, (5) University of Maryland, (6) Bell Laboratories, (7) NASA/Goddard Space Flight Center. tylka@gamma.nrl.navy.mil/Fax: 001-202-767-6473

Gradual solar energetic particle (SEP) events are those in which particle acceleration is believed to occur primarily at shocks driven by fast coronal mass ejections (CMEs). Energy spectra provide a potentially powerful tool in understanding SEP events, in that the spectra contain information on all aspects of SEP production, including source plasma (as reflected in ionic charge states), interplanetary transport effects (as evidenced by rigidity- and velocity-dependent spectral distortions), and characteristics of the shock accelerator itself (such as exponential rollovers, or "knees", which arise from finite shock-size and lifetime effects.) We compare time-dependent particle spectra for several of the largest events seen so far in Cycle 23 by combining data from Wind, ACE, IMP-8, and GOES. The combined data cover all major species from H to Fe, from near suprathermal energies (~30 keV/nuc) to several hundred MeV/nuc, depending upon species. We will show how spectral characteristics of these events reflect various aspects of SEP production. We will especially emphasize the 14 July 2000 "Bastille Day" event, during which extraordinarily high particle intensities caused instrumental problems which pose a particular challenge.