

# Appearance of a Third Episode of Enhanced Particle Intensities at 94 AU: Voyager 1 in the Heliosheath

E. C. Stone<sup>a</sup>, A. C. Cummings<sup>a</sup>, F. B. McDonald<sup>b</sup>, B. C. Heikkila<sup>c</sup>, N. Lal<sup>c</sup> and W. R. Webber<sup>d</sup>

(a) *California Institute of Technology, Pasadena, CA 91125, USA*

(b) *University of Maryland, College Park, MD 20742, USA*

(c) *NASA/Goddard Space Flight Center, Greenbelt, MD 20771, USA*

(d) *New Mexico State University, Las Cruces, NM 88003, USA*

Presenter: E. C. Stone (ecs@srl.caltech.edu), usa-stone-E-abs1-sh31-oral

The Voyager 1 spacecraft crossed the solar wind termination shock on 16 December 2004 at 94.0 AU and began observing a new episode of enhanced intensities of termination shock particles (TSPs) in the heliosheath. Two earlier TSP episodes were observed upstream of the shock beginning in mid-2002 at 84 AU as Voyager 1 and the shock were moving outward together. The upstream TSPs exhibited strong field-aligned beaming and large spectral variability on a daily time scale that likely resulted from variations in the connectivity of Voyager 1 to the source at the shock. In the heliosheath the TSP intensity and spectra are much less variable and the field aligned streaming greatly reduced, consistent with more uniform propagation conditions and a stable source intensity. The gradual evolution of the of the TSP and ACR spectra as Voyager 1 moves further beyond the shock should reveal new aspects of the heliosheath and acceleration of TSPs and ACRs.

## 1. Acknowledgements

This work was supported by NASA under contract NAS7-03001.

