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High Energy Ionic Charge State Composition in the October/November 2003 and January 20, 2005 SEP Events

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The ionic charge states of solar energetic particles (SEPs) probe source material temperatures and acceleration and transport conditions. The MAST instrument on SAMPEX measures SEP ionic charge states at energies greater than ~15 MeV/nuc and at iron energies up to ~90 MeV/nuc using the geomagnetic filter technique. Charge state measurements for large gradual SEP events by MAST and by other experiments suggest a continuum of charge states for various elements correlated with abundance ratios (e.g. Fe/O). We present charge state measurements for the October/November 2003 events that suggest different source material temperatures for these events. We also present charge state measurements for the January 20, 2005 event, which contrasts with the previously demonstrated Q(Fe) vs. Fe/O correlation. We discuss the implications of our results for models involving stripping during acceleration and a mixture of different source material populations.

This document is a confirming abstract. A final paper will be submitted before the conference.