

## The Dynamic GLE Proton Spectrum of 2001 April 15 and 2005 January 20

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We report the proton spectrum of two GLEs, 2001 April 15 and 2005 January 20. Using two instruments, the Climax neutron monitor and the Milagro ground based TeV gamma-ray telescope, we constructed the spectrum of the highest energy part of the GLE spectrum. The many available rigidity thresholds in the Milagro instrument, coupled with the nearby Climax NM, allows one to construct a differential spectrum above 1 GV rigidity. We find that the impulsive, anisotropic phase of both events is systematically harder than the delayed isotropic phase. We fit both spectra to power laws in energy with exponential roll overs. We find that the roll over energy abruptly drops after the anisotropic phase and seems to remain roughly constant thereafter. Because the roll over energy embodies important physics in the shock acceleration process, this implies that if the particles in the delayed phase came directly from the shock, the conditions changed significantly or that the original population injected by the shock has been modified by transport effects.

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