

## **Energetic Proton Spectra in the 11 June 1991 and 24 October 1991 Solar Flares**

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We have analyzed portions of the 11 June 1991 and 24 October 1991 solar flare gamma-ray spectra that we believe arise from soft proton or ion spectra. Using data from the COMPTEL instrument on the Compton Observatory we interpret the gamma-ray line intensities at 2.223 MeV, 1.63 MeV and the weak CNO lines from 4-7 MeV in terms of the parent proton spectrum responsible for the emission. In order to properly interpret the 2.223 MeV line from the capture of thermal neutrons on hydrogen we employ an analytical model of the neutron transport in the solar photosphere to estimate the gamma-ray line attenuation and scattering. For soft proton spectra, inelastic neutron reactions are negligible and one need only consider elastic scattering off hydrogen and helium and losses through capture on hydrogen and  $^3\text{He}$ . We jointly constrain the proton spectrum and the  $^3\text{He}$  abundance for both events and compare the results with more extensive Monte Carlo calculations and other particle data.