

## High-energy particle production in the 1997 November 6 flare as viewed from gamma rays and neutrons

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**Abstract.** Yohkoh observed hard X- and gamma-rays from a X9.4 flare on November 6, 1997. Strong gamma-rays were emitted in 11:52-11:56 UT (peak phase). After that, weak and extended gamma-ray production lasted for 600s (extended phase). The OSSE aboard CGRO detected neutrons associated with this flare between 12:08 and 12:28 UT. The neutron count-rate time profile exhibit a gradually decrease with time. We derive the proton spectra and the timing of particle acceleration to explain the observed neutron time profile.

The proton spectra of  $E^{-3.5}$  in the peak phase and of  $E^{-3.0}$  in the extended phase give a good fit to the observed neutron time profile. We present detailed calculations of the neutron arrival time profiles and discuss high-energy particle production processes from the gamma-ray neutron observations.

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