RECENT YOHKOH SOLAR GAMMA-RAY OBSERVATIONS

M. Yoshimori (1), K. Suga (1), S. Nakayama (1), H. Ogawa (1), G.H. Share (2) and R. J. Murphy (2)
(1) Rikkyo University, (2) Naval Research Laboratory
yosimori@rikkyo.ne.jp / FAX: +81-3-3985-2418

Yohkoh observed two gamma-ray flares in 2000, a X5.7/3B flare (N16 E02) at 10:20 UT on 14 July and a X2.3/3B flare (N23 W05) at 15:08 UT on November 24. The two flares emitted nuclear gamma-ray lines of C (4.44 MeV) and O (6.13 MeV) and neutron-capture line at 2.22 MeV, implying that ions were efficiently accelerated and precipitated to the chromosphere. The gamma-ray flux (2.22 and 4-7 MeV) of the November 24 flare is a few times as large as that of the July 14 flare. We derive the ambient 3He to H ratio from the time profiles of 2.22 MeV line. CMEs and SEPs were measured from both events, suggesting that SEPs were accelerated by CME-driven shocks. In particular, the July 14 event produced exceptionally intense SEP event with a long duration. We discussed gamma-ray-producing particle and SEP production processes on the basis of the Yohkoh and SEP observations.