Inverse Compton Scattering from Laser Accelerated Quasi-Monoenergetic Electrons

YOSHITAKA MORI, GPI, Hamamatsu, Japan, HAJIME KUWABARA, IHI, Yokohama, Japan, KATSUHIRO ISHII, RYOHEI HANAYAMA, GPI, Hamamatsu, Japan, TOSHIYUKI KAWASHIMA, Hamamatsu photonics, hamamatsu, Japan, YONEYOSHI KITAGAWA, GPI, hamamatsu, Japan — The progress of the laser accelerator shows us the possible applications to the industries, such as an inspection source for soft materials like as human bodies, plants foods and medicines. The inverse Compton scattering will realize such a novel inspection system. We demonstrate for the first time that the laser-accelerated mono-energetic electrons inversely scatter the same counter laser beam to the Compton X-ray emissions. A Ti:sapphire laser (500mJ width 150fs) is divided into two beams. Main beam is focused to an edge of a helium gas jet to accelerate electrons to 13 and 22 MeV monoenergies, which inversely scattered the counter laser beam into 6 and 11 keV X-ray emissions in agreement with that calculated from the obtained electron spectra. The scattering is within 30 deg. around the main beam direction.

1This work was supported by the Grants-in-Aid for Scientific Research of MEXT #21244088, the Grants of the Science Research Promotion Fund of the Promotion and Mutual Aid Corporation for Private Schools of Japan, and the GPI-IHI research collaboration.

Yoshitaka Mori
GPI, Hamamatsu, Japan

Date submitted: 30 Aug 2010
Electronic form version 1.4