



ID de Contribution: 122

Type: Non spécifié

Laser Compton Scattering X-ray Source at AIST

We have developed a quasi-monochromatic hard X-ray source via laser Compton scattering (LCS) based on the S-band compact electron linac at AIST. All of system is built in one research room about 10 meters square. The electron injector consists of a laser photo-cathode rf gun which has the BNL type S-band 1.6 cell cavity and a solenoid magnet for emittance compensation. The linac has two 1.5-m-long accelerator tubes which is a $1/2 \pi$ mode standing wave structure. The electron beam can be accelerated up to about 42 MeV and collide with a TW Ti:Sa laser for the LCS X-ray generation. The maximum energy of the X-ray can be tuned 10 –40 keV in a few % energy bandwidth by changing the electron energy, and total photon yields are obtained to be about 10^7 photons/s for medical and biological applications. In this summit, we will report the present status of our system and some suggestions for the global communication between Asia and Europe groups about the development of LCS X-ray sources.

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