

**Electron Beam Energy Measurement by Laser Compton Scattering** \*, I.C. HSU, C.C. CHU, A.T. LAI, C.I. CHEN, C.I. YU, C.P. WANG, G.Y. HSIUNG, P.K. TSENG, R.C. CHEN, R.C. HSU, Y.C. LIU, National Tsing Hua Univ. and SRRC, Taiwan - Laser Compton scattering by relativistic electrons provides the energy information associated with the electron beams in an accelerator. The determination of the electron energy by this method depends chiefly on the signal-to-noise ratio (S/N) associated with laser Compton scattering. This study provided a method to enhance the S/N ratio by synchronous measurement with a high peak power pulsed CO<sub>2</sub> laser. In this method, the gate trigger signals were provided by the pulsed CO<sub>2</sub> laser, and the delay time of these triggers were optimized to obtain a maximum S/N ratio. In the storage ring of SRRC, a g-ray with highest energy of 3.021 MeV was backscattered after the 0.1172 eV laser photons colliding with the 1.3 GeV electrons. The S/N ratio was about 42.5 with the electron beam current being 19 mA.

\* Supported by the National Science Council of R.O.C., Contract NSC81-0417-E-07-545 and SRRC, R.O.C.