Diagnostics of Subpicosecond Electron Beam by Michelson Interferometer and Femtosecond Streak Camera, J. SUGAHARA, T. UEDA, M. UESAKA, T. WATANABE, K. YOSHII, Univ. of Tokyo; Y. SHIBATA, Tohoku Univ. - Longitudinal bunch shapes of subpicosecond and picosecond electron beams have been determined by the Michelson interferometer utilizing coherent transition radiation (TR) emitted at an Al foil. Subpicosecond and picosecond electron beams were generated by the 35 MeV linear accelerator at Nuclear Engineering Research Laboratory, University of Tokyo [1]. From the interferogram we can reconstruct the longitudinal bunch shapes of the electron beams by several procedures based on the bunch form factor and assumption of distribution [2,3]. The results of reconstruction are compared with the measured results by the femtosecond streak camera and the validity of the procedures are discussed. A design of the interferometer for less than 200 fs (the resolution of the streak camera) electron beam is proposed.

[1] M. Uesaka et al., Phys. Rev. E 50 (1994) 3068-3076.
[2] Y. Shibata et al., Phys. Rev. E 50 (1994) 1474-1484.
[3] Hung-chi Lihn et al., Phys. Rev. E 50 (1996) 6413-6418.