

**Cooling Force Measurements for the Superconducting Electron Cooler at the Storage Ring TARN II**, I. KATAYAMA, S. ONO, T. TANABE, CNS, Univ. of Tokyo; Y. ARAKAKI, K. CHIDA, T. WATANABE, KEK; T. HONMA, K. NODA, NIRS; Y. HARUYAMA, M. SAITO, Kyoto Pref. Univ.; K. HOSONO, HIT - A superconducting electron cooler [1] at the storage ring TARN II has been operated since November 1996 and high-resolution atomic physics experiments have been performed with the ultracold electron beam from the cooler. In this cooler, an electron beam is expanded by a factor of 100 in a gradually decreasing solenoid field from 3.5 to 35 mT and an electron temperature on the order of 1 meV was attained for the first time. In order to estimate the cooling force accurately, we newly installed an induction accelerator in the ring. The linear portion of the cooling drag force is determined from the velocity shift of the ion beam under the balance between the drag force of the electron beam and the external force of the induction accelerator. This paper summarizes the results of the cooling force measurements for the superconducting electron cooler.

[1] T. Tanabe et al., EPAC96, p.1190.