

DEVELOPMENT OF INDUCTION MODULES FOR HIGH POWER ACCELERATOR

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Research activities for high power induction accelerator system in the TIT-KEK-JAERI-RIKEN group are presented including a research effort for high flux ion injector, and R&Ds on induction voltage modulators for repetitive operation and precise voltage modulation. Using an induction modulator, high flux beams are directly extracted from a laser ablated expanding plasma. A proof-of-principle experiment on basic module shows that the module elements are successfully operated up-to MHz with good re-reproducibility[1]. The first experiment on the induction synchrotron is scheduled this year using the KEK 12-GeV proton synchrotron. For the experiments, a proto type induction modulator has been developed. One of the serious problem for beam modulation is some droop in the acceleration voltage because of a finite length of the transmission cable between the voltage driver and the induction cell[2]. In order to precisely control the accelerating voltage, a method is proposed for power transport without any load mismatching through the long transmission line. Efforts for the component technologies of the induction accelerator along with a consideration on high power accelerator system will be discussed.

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2. Y.Shimosaki, E.Nakamura, K.Takayama, k.Torikai, M.Watanabe, M.Nakajima, K.Horioka, "Beam-dynamic effects of a droop in an induction accelerating voltage" *Phys. Rev. Special Topics-Accelerator and Beams*, 7, (2004) 014201.