Abstract Submitted for the DPP05 Meeting of The American Physical Society

Experimental study of compact toroid acceleration and transportation with the SPICA and HIT-CTI2 injectors N. FUKUMOTO, M. NAGATA, University of Hyogo, J. MIYAZAWA, H. YAMADA, National Institute for Fusion Science, T. ASAI, T. TAKAHASHI, Nihon University, A. SANPEI, S. MASAMUNE, Kyoto Institute of Technology, M. IRIE, Waseda University — The acceleration and transportation of a compact toroid (CT) have been studied for Tokamak and Helical refueling purposes. The SPICA injector has been developed as a fueller for LHD at NIFS. We conducted various systematic scan of the operation parameters. The following CT parameters were obtained: v \sim 300 km/s, n \sim $6 \times 10^{21} \text{ m}^{-3}$ and B ~ 0.2 T. However, in the experimental demonstration of CT injection into the 3.6 m long test chamber, the performance was not high enough to realize the core CT penetration into LHD. Therefore, CT injection into a flux conserver has been performed to optimize the operation parameters. In addition, we recently proposed vertical CT injection with forked drift tubes so that the CT can be injected in any radial position in the target plasma. The injection port can be flexibly switched shot-by-shot by applying an external magnetic field, which acts as a magnetic wall to obstruct one exit in the forked tube, guiding the CT to another exit. In order to study this unique control method of CT transportation, experimental switching of the CT traveling direction in the forked tube has been carried out using the HIT-CTI2 at the University of Hyogo. Results from these experiments will be presented.

> N. Fukumoto University of Hyogo

Date submitted: 22 Jul 2005

Electronic form version 1.4