

Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Development of Low-Cost Pulsed NBI system for UTST high-beta ST Experiment M. SAWAHATA, Y. ONO, E. KAWAMORI, Y. TAKASE, Univ. Tokyo, N. YAMAGUCHI, H. KAJIYA, H. SUGIE, T. ASAI, T. TAKAHASHI, Nihon Univ., K. SATO, Kyusyu Univ. — The UTST experiment at Univ. Tokyo is expected to produce ultra-high-beta ($\sim 50\%$) Spherical Tokamak (ST) using mega-watt heating power of ST merging/ reconnection. A key issue after the formation is to maintain the produced ultra-high-beta ST over 100 Alfvén time for its stability research. The following three heating methods are arranged for the sustainment experiment: (1) advanced RF heating method developed by TST-2, (2) low-cost pulsed Neutral Beam Injection (NBI) system under development and (3) intermittent merging/ reconnection by TS-3 and 4. The NBI system for UTST was designed to realize, (1) low voltage (15kV for low-field side of STs), (2) high current (20A), (3) maintenance-free, (4) low-cost, and (5) pulsed operation. Its pulsed operation enables us to remove all cooling system from the electrode system with curvature radius 1500[mm] and effective diameter 218[mm], decreasing significantly the cost for the electrode system. A SUS washer gun was used for the first time to realize the maintenance-free plasma (ion) source, in sharp contrast with the conventional filament type plasma source. Our initial operation of plasma source already measured the electron density profile suitable for the NBI ion source. More detailed results for the NBI development will be presented.

Yasushi Ono
University of Tokyo

Date submitted: 21 Jul 2006

Electronic form version 1.4