

Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Spherical tokamak start-up and sustainment experiments on UTST T. YAMADA, R. IMAZAWA, S. KAMIO, R. HIHARA, K. ABE, M. SAKUMURA, Q.H. CAO, T. OOSAKO, H. KOBAYASHI, T. WAKATSUKI, B.I. AN, Y. NAGASHIMA, M. INOMOTO, A. EJIRI, Y. TAKASE, Y. ONO, Univ. Tokyo, H. SAKAKITA, H. KOGUCHI, S. KIYAMA, Y. HIRANO, AIST, UTST TEAM — The University of Tokyo Spherical Tokamak (UTST) device was constructed for the purpose of formation and sustainment of ultra-high beta spherical tokamak (ST) plasma using double null plasma merging and radio-frequency (RF) / neutral beam injection (NBI) heatings. The main feature of UTST is that the poloidal field coils are located outside the vacuum vessel in order to demonstrate the start-up in a more reactor relevant situation. Initial operations were carried out using partially completed power supplies to investigate the appropriate conditions for plasma merging. Plasma current of the merged ST was 50 kA, and reached 170 kA by using the central solenoid coil for assistance of plasma formation. Merging of two ST plasmas through magnetic reconnection was successfully observed by using two-dimensional pickup coil arrays, which directly measure the toroidal and axial magnetic fields inside the UTST vacuum vessel. There are two methods, which are now in progress, to sustain the ultra-high beta ST created on UTST; radio-frequency heating (400 kW and 21 MHz) and neutral beam injection (500 kW and 15 ms).

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Date submitted: 17 Jul 2009

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