

Abstract Submitted
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Double null merging start-up experiments on UTST TAKUMA YAMADA, SHUJI KAMIO, KEITA ABE, MORIO SAKUMURA, QINGHONG CAO, NAOTO SUZUKI, TAKENORI WATANABE, MICHIAKI INOMOTO, YUICHI TAKASE, YASUSHI ONO, The University of Tokyo, RYOTA IMAZAWA, Japan Atomic Energy Agency, KOJI ISHIGUCHI, The Open University of Japan — The University of Tokyo Spherical Tokamak (UTST, Univ. Tokyo) is a unique device in the world that demonstrates merging start-up of spherical tokamak (ST) by using double null merging (DNM) method. Unlike the other plasma merging devices, such as MAST (UKAEA) and TS-3/4 (Univ. Tokyo), the poloidal field coils of UTST are located outside the vacuum vessel, for the purpose of more reactor-relevant merging startup. The goals for the UTST experiment are to generate a high-beta ST through magnetic reconnection, and to sustain it by external heating such as neutral beam injection. Using the present power supply under construction, we successfully demonstrated the DNM start-up whose plasma current and the duration time are 40 kA and 0.6 ms. We increased them to 120 kA and 1.2 ms, respectively, by using a central solenoid coil in addition to the DNM discharge. Our 2D magnetic probe array composed of 290-channel pickup coils directly measured field line reconnection of two merging ST plasmas and its heating power of 1.7 MW using jxB plasma pressure.

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