

Abstract Submitted  
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**Experimental Demonstration of Double Null Merging Start-up on UTST** RYOTA IMAZAWA, SHUJI KAMIO, RYUMA HIHARA, KEITA ABE, MORIO SAKUMURA, QINGHONG CAO, TAKUMA YAMADA, MICHIAKI INOMOTO, YUICHI TAKASE, YASHUSHI ONO, The University of Tokyo — We made double null merging(DNM) experiments using outer poloidal field(PF) coils on UTST. We successfully generated two STs at two null points by using a washer gun, and succeeded in merging them. The DNM scheme is started by two magnetic null points generated at the upper and lower regions inside the vacuum vessel. Then poloidal flux swing generates two STs at two null points formed by two pairs of outer PF coils. Finally, the coil currents push two STs toward the mid-plane, and merge them into single ST. Since magnetic reconnection during merging transforms a magnetic energy into a thermal energy, this merged ST plasma is expected to have ultra high beta. It must be noted that DNM scheme can make ST without center solenoid coils. The DNM scheme was demonstrated on TS-3/4(JAPAN) and MAST(UKAEA). However these devices have all PF coils inside the vacuum vessel, and initial plasmas were generated around PF coils, not null points. Since the internal coils are not feasible in the fusion reactor, it is important to demonstrate that the outer PF coils induce electric fields for the breakdown and the formation of two STs.

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