IAEA FEC 2014

Contribution ID: **495** Type: **Poster**

Experimental Study of Disruption Mitigation Using Supersonic Molecular Beam and Massive Gas Injection on HL-2A and J-TEXT

Friday 17 October 2014 08:30 (4 hours)

In tokamak experiments, including JET, JT-60U, Tore Supra, and TEXTOR, it has been shown that the runaway electron (RE) generation occurs usually above a threshold at Bt ≈ 2 T independent on machine size. Recently, disruption mitigation experiments with SMBI and MGI have been carried out in the HL-2A and J-TEXT tokamaks to study various injection scenarios and gas jet penetration. The improved SMBI system has been developed at HL-2A with a larger orifice(0.5mm of diameter), a quite shorter opening time (0.2ms), and its maximum throughput is up to 1.0×10^21 (10ms，50bar). The SMBI was triggered by a negative voltage spike in the loop voltage signal prior to the thermal quench. In the SMBI mitigation experiments at HL-2A, the RE plateau is achieved even at Bt = 1.3 T, much lower than the Bt threshold observed in other tokamaks. Both Ne and Ar gases could create runaway electron at Bt = 1.3 T. In addition, A fast massive gas injection valve has been constructed and tested on the J-TEXT tokamak, whose shortest opening time is about 0.25ms and maximum gas capacity is 1.0×10^24. In J-TEXT disruption mitigation experiments, after injecting Ar to induce disruption, both Bt threshold and electron density threshold of the RE plateau generation are observed in J-TEXT. The threshold of Bt is 1.2T, similar to that found in HL-2A. The RE plateau is easier to obtain at lower electron densities. This might be understood by hot tail RE generation.

Country or International Organisation

China

Paper Number

EX/P7-31

Author: Dr DONG, Yunbo (Southwestern Institute of Physics)

Co-authors: Mr CHEN, Chengyuan (Southwestern institute of physics); Prof. ZHUANG, Ge (Huazhong University of Science and Technology); Dr ZHUANG, Huidong (Institute of Plasma Physics); Dr GAO, Jinming (Southwestern Institute of Physics); Dr ZENG, Long (Institute of Plasma Physics); Prof. LIU, Yi. (Southwestern Institute of Physics); Mr LUO, Yihui (Huazhong University of Science and Technology); Dr ZHANG, Yipo (Southwestern Institute of Physics); Prof. XU, Yuhong (Southwestern Institute of Physics); Dr CHEN, Zhongyong (Huazhong University of Science and Technology)

Presenter: Dr DONG, Yunbo (Southwestern Institute of Physics)

Session Classification: Poster 7