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Investigation of the high density discharges on the J-TEXT Tokamak PENG SHI, GE ZHUANG, LI GAO, JIE CHEN, QIANG LI, YANG LIU, XI-AOLONG ZHANG, Institute of Fusion and Plasma Research, Huazhong University of Science and Technology, Wuhan 430074, PR China — Recently, the operation region has been explored for J-TEXT Ohmically heated discharges by means of gas puffing. The results showed that the maximum achievable density has been significantly expanded, from $0.43 n_G$ (Greenwald limit) to $0.85 n_G$, after the stainless steel vacuum wall was covered by the graphite tiles. Nevertheless, the J-TEXT high density discharges were frequently terminated by a disruption. The investigation concluded that the maximum achievable density strongly relied on the total plasma current I_P , but very weakly depended on the edge safety factor q_a . Some features of such disruption have been identified by analyzing the measured data from the 17-channel (covering $-0.94a \sim 0.94a$ of the cross-section) FIR polarimeter-interferometer. For example, in the density ramp-up phase, asymmetry of density profile between the LFS (low field side) edge ($r > 0.8a$) and the HFS (high field side) edge ($r < -0.8a$) would appear gradually. In addition, a reversed density gradient on the HFS edge occurred. Before the disruption, edge density on the HFS suddenly dropped to a lower level and tended to restore the symmetry of density profile between the LFS and HFS edge. Simultaneously, the radiation measurements, including CIII impurity radiations, soft X-ray emissions and so on, indicated that plasma radiation increased dramatically. Such lower density level at the HFS edge can maintain for $\sim 100ms$ when $q_a > 5$, but less (or even null) for $q_a < 3.5$

Peng Shi
Institute of Fusion and Plasma Research,
Huazhong University of Science and Technology,
Wuhan 430074, PR China

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