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EX/P3-10: Collisionality Dependence of Confinement in T-10 L-Mode Plasmas

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Investigation aimed at the understanding of a general origin of the thermal and particle transport has been carried out in regimes with the dominant electron heating in the T-10 tokamak. ECR heating with the power of 0.25-3 MW has been used. Two scans have been summarized for the analysis: density scan at the constant EC heating power value, ($P_{EC}=0.9$ MW, $P_{tot}=1$ MW), and recently obtained EC heating power scan at the fixed density $n_e=1.8 \cdot 10^{19} \text{ m}^{-3}=0.25 n_{Gw}$. The value of the effective collisionality was changed in the range $\nu_{eff} 0.1-10$. For the first time it was shown that the main regularities of the energy and particle confinement do not depend of the method of collisionality modification. These features are the following: i) energy confinement time increase with collisionality and saturates at $\nu_{eff} 1-2$; ii) the density peaking increases with collisionality and goes to higher level at the same ν_{eff} value, $\nu_{eff} 1-2$; iii) the density profile flattening becomes stronger with collisionality increase in the ECR heated discharges in comparison with the ohmically heated discharges taken at the same collisionality.

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