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Effect of Resonant Magnetic Perturbation on boundary plasma turbulence and transport on J-TEXT tokamak (bold, 14 pt)

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Abstract

Experimental study of the effect of Resonant Magnetic Perturbation (RMP) on boundary plasma turbulence and transport on J-TEXT is presented in this paper. Langmuir probe arrays have been used to measure plasma fluctuations in the edge and SOL region with and without $m/n = 2/1$ RMP current of 6 kA. It has been found that fluctuation in the edge and SOL region has been dropped clearly with the application of RMP with 6 kA current. Turbulence at $\rho \sim 0.9$ has characteristic frequency of 40 -150 kHz, and it has been strongly suppressed by RMP with 6 kA current; in near SOL, radial turbulent particle flux and blob transport have reduced dramatically. Hence it is concluded that turbulence and transport in plasma boundary, and blob transport in near SOL have been suppressed by RMP with 6 kA current. It agrees with the results on TEXTOR. The results may suggest that RMP may be an effective tool to control plasma turbulence and blob transport in the boundary.