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CONTROL OF HIGH ENERGY RADIATIONS OF PLASMA IN IR-T1 TOKAMAK

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The energetic flow of runaway electrons has seriously damaged the first wall of the Tokamak. For this reason, stopping the production of runaway electrons and reducing the energy of these electrons have been considered in the current Tokamak .To this aim the effect of vertical magnetic field on the behavior of runaway electrons and high energy radiations was evaluated in the present study. Runaway probe in plasma edge of IR-TI Tokamak was used for measurement. For this purpose, this probe was constructed and installed on IR-T1 Tokamak. In addition, Beta and Gamma rays were detected by new runaway probe in the IR-T1 Tokamak, where the electron spectrum ranged between 500 KeV and 2 MeV at the plasma edge in the IR-T1 Tokamak. Further, considering the significance of the vertical magnetic field role in the final balance of the plasma column, the effect of this field on decreasing the Beta and Gamma radiation was considered. Furthermore, vertical magnetic field value changed from B=0.34T to B=0.41T and B= 0.45T. Based on the results, the plasma confinement time can be increased about 3ms by increasing the vertical magnetic field in IR-T1 Tokamak. Finally, a significant increase was observed in the plasma current and the count and intensity of the existing radiations reduced after increasing vertical magnetic field.

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