EXPERIMENTAL INVESTIGATION OF PLASMA FLOWS FROM OPEN TRAP WITH THE TOROIDAL DIVERTOR UNDER ECR DISCHARGE

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The results of the experimental studies of plasma flows escaping from the open trap with the toroidal divertor are presented. Cold plasma is produced when introducing the microwave power in the presence of the electron cyclotron resonance ( ECR ). The radiation passes the waveguide through a dense ceramic vacuum window being introduced across the axis of the device. From source plasma escapes in three direction: to both open trap taps and to divertor slots. By means of the Langmuir probes the spatial distribution of plasma parameters have been measured. Ions parameters have been measured with multigrid Retarding Potential Analyzer (RPA). The maximum density is limited by the critical density nc ( ~ 1012 cm -3 ) for the used generator frequency. It has been found that plasma density of divertor slots escaping flow is at least order low then density in the open trap. The temperature and density of trapped and escaping flows practically do not depend on the radius when the ECR zone is located near the open trap confinement region and density is closed to nc. At a density of n <nc plasma ring structures are observed near the separatrix , which were disintegrating by the influence of ( the development of ) the low-frequency short-wave instability. Plasma escaping has MHD behavior when magnetic field and plasma density are decreasing order of magnitude The possible mechanisms of occurrence of structures and the plasma flows nature are discussed.