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Investigation of electron energy distribution function in a weak magnetic field in solenoidal inductive discharge YEONG-KWANG LEE, JU-HWAN KU, CHIN-WOOK CHUNG, Hanyang University — Plasma parameters such as electron temperatures, plasma densities, and dc plasma potential in the vicinity of electron cyclotron resonance (ECR) in the solenoidal inductive argon discharge have been investigated by observing electron energy distribution function (EEDF). Langmuir probe method system was built to study the EEDF dependencies on the radial position and rf driving frequency. The measurement was performed on the bulk plasma under range of weak dc magnetic field (0 - 20 G) at low pressure and power. In this study, the changes in the radial profile of the plasma parameters with respect to the varying the magnetic field was discussed. It was experimentally verified that no effective electron temperature maximum appear at ECR condition due to the characteristics of the local electron kinetics, while plasma density maximum appears at different magnetic field. Furthermore, the measured dc plasma potential largely increases with the rf driving frequency. These results are also compared with that of the typical planner inductive discharge [1].

[1] C.W. Chung, S. S. Kim, and H.Y. Chang, Phys. Rev. E 69, 016406 (2004)

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