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On the multistep ionizations in argon inductively coupled plasms MINHYONG LEE, SUNGHO JANG, CHINWOOK CHUNG, Dept. of Electrical Engineering, HANYANG UNIVERSITY TEAM — The effect of the multistep ionizations on the plasma parameters in the inductively coupled plasma (ICP) has been investigated by experiments and theory. To obtain electron density and electron temperature precisely at various powers and pressures in the ICP, the electron energy distribution functions (EEDFs) are measured. It is found that at high pressures, the electron temperature from the EEDFs decreases and the electron density increases rapidly with the absorbed power while, at low pressures, the electron temperature is hardly changed and the electron density is almost linearly proportional to the absorbed power. The comparison between the experiment and our model including the multistep ionizations [M. H. Lee and C. W. Chung, Phys. Plasmas 12, 73501 2005] was done and the experiment was in close agreement with the model. This shows that the changes in the electron density and the electron temperature in the ICP are mainly due to the multistep ionizations.

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