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Electron energy distribution function measurement in a CO_2/Ar inductively coupled plasma KYUNG-HYUN KIM, KWAN-YONG KIM, CHIN-WOOK CHUNG, Department of electrical engineering, Hanyang university — Electron energy distribution functions (EEDFs) in CO_2/Ar mixed plasma were measured at various fractions of the argon. Electron density increases with ratio of the argon. Electron temperature has maximum values in a pure CO_2 plasma. On the other hand, the electron temperature increases with the argon ratio in CO_2/Ar plasma. EEDF becomes from Maxwellian to non-Maxwellian by increasing pressure and decreasing the Ar ratio because Maxwellization of EEDF is determined by the electron-electron collision frequency and electron energy relaxation frequency. Unusual phenomenon occurs at intermediate pressure, 50 mTorr. It is the EEDF of the pure CO_2 plasma is closer to the Maxwellian than those of the CO_2/Ar plasma with a small proportion of Ar. This result seems to be effect of superelastic collisions determined by vibration-vibration (V-V) exchange and vibration-translation (V-T) relaxation.

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