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Measurement of the electron energy distribution function and E-H mode transition in inductively coupled plasma with various gases
JUNG-KYU LEE, HYO-CHANG LEE, CHIN-WOOK CHUNG, Hanyang University — A study of the E-H mode transition was performed in Ar, O₂, N₂, and mixture gas inductively coupled plasma (ICP) from the measurement of the electron energy distribution function (EEDF). Change of the EEDF and characteristic of the discharge on the E-H mode transition were discussed. At each E mode, the measured EEDFs had different shapes depending on the gas type and pressure, while the EEDFs evolved into Maxwellian distribution with the E-H transition due to electron-electron collisions. This study was also focused on the transition ICP power from E mode to H mode. As the ICP power increased in Ar discharge, the transition ICP power had minimum value at a particular pressure, while the transition ICP power was gradually increased with gas pressures in molecule gas discharge. The transition ICP power with gas mixing ratios was also studied in Ar/O₂/N₂ mixture gas discharge.

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