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**Real time feedback control of plasma density by using a floating probe in inductively coupled plasmas** SUNG-HO JANG, JIN-SUNG KIM, MIN-HYONG LEE, CHIN-WOOK CHUNG, Electrical Engineering, Hanyang University, Republic of Korea — A real time feedback control of plasma density was carried out experimentally in inductively coupled plasma (ICP). The plasma density was measured by a floating probe (P&A Solutions, Wise probe<sup>TM</sup>) which can measure the plasma density in real time without plasma perturbation installed on a chamber wall, and the measured information was fed back to actuator to influence the plasma density. This plasma control system allowed the plasma density to reach and keep the desired densities below 0.1% of the state error. To describe External disturbances, the pressure of the chamber was dropped from 10 mTorr to 5 mTorr by using a molecular flow controller. At the pressure disturbance, the density decreases, and recovers with 1.5% of the maximum error and 10 s of the settling time. In the comparison of active and inactive control with pressure disturbance, the maximum state errors were 1.5% and 40% respectively.

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