

Abstract Submitted  
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**Electron series resonance in an inductive ion etching reactor** HYO-CHANG LEE, JIN-YOUNG BANG, CHIN-WOOK CHUNG, Electrical Engineering, Hanyang University, Republic of Korea — The electron series resonance at an RF bias substrate was observed in a 13.56 MHz inductively coupled plasma (ICP). As ICP coil power increases, the impedance of the RF bias transits from a capacitive load to an inductive load. When bias voltages and discharge impedances reach minimum values, bias voltages and currents are in-phase at the transition. The transition can be understood as a series LC resonance between sheaths (capacitor) and plasma bulks (inductance due to electron inertia). This corresponds to the electron series resonance (ESR) observed in very high-frequency capacitive discharges, and a new ESR frequency is presented when sheath resistances are considered.

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