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Electrical and Plasma Parameters of Distributed ICP Driven by Ferromagnetic Core Array WONKI LEE, CHINWOOK CHUNG, HanYang University, V.A. GODYAK, OSRAM Sylvania — Two distributed plasma sources were explored and results were compared with corresponding data obtained in a conventional ICP with flat coil driven at 13.56 MHz. The first source was driven with six toroidal ferromagnetic cores at 400 kHz. This source was able to operate in a wide range of the input rf power. In reported experiments, the rf power delivered to plasma was up to 4 kW at the input rf voltage less than 300 V and high power factor and power transfer efficiency. The second source driven with eighteen toroidal inductors at fixed rf power has demonstrated an exceptional plasma uniformity measured near the discharge chamber bottom. Due to mainly resistive input impedance, the power factor of both ICP sources was close to 1 and the input voltage and current are order of magnitude less than in the similar wattage conventional ICP system operating at 13.56 MHz. Plasma parameters, the plasma density and electron temperature were obtained as appropriate integrals of the measured electron energy distribution functions. A twice less the plasma potential (15 V) was found in ICP driven with ferromagnetic cores at 400 kHz than that in the conventional ICP driven at 13.56 MHz. It seems that ICP with ferromagnetic cores has a great potential as a plasma sources for next generation plasma processing.

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