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Strong modification of the electron energy distribution function in inductive discharge in SF_6/Ar Plasmas due to additional capacitive bias with small power input HYO-CHANG LEE, CHIN-WOOK CHUNG, Hanyang University, IGOR D. KAGANOVICH, Plasma Physics Laboratory, Princeton University — We have performed experimental study of the electron energy distribution function (EEDF) in inductive discharge in SF_6/Ar plasmas with additional capacitive bias. The power transferred to the inductive coil was fixed to 100 W and an additional power to the capacitive biased was varied from 0 to 15 W. In case of discharge in 10% SF_6/90%Ar gas mixture, a small additional power provided by a capacitive bias had little effect on EEDF, whereas in 50% SF_6/50%Ar gas mixture, the EEDF was strongly modified by capacitive bias. Possible explanation is due to strong reduction of ambipolar potential in the plasma in strongly electronegative gases. In low gas pressure electro-positive plasmas, high energy electrons are heated by large rf field in the sheath, while low energy electrons are confined in the bulk plasma and cannot participate in the sheath heating due to ambipolar potential. In electro-negative plasmas ambipolar potential is small and the sheath heating by capacitive field acts on both low energy electron and high energy electrons.

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