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Influence of capacitive bias on electron dynamics in an inductively coupled plasma MUJAHID ZAKA-UL-ISLAM, Centre for Plasma Physics, Queen's University Belfast, Belfast BT7 1NN, UK, TIMO GANS, York Plasma Institute, Department of Physics, University of York, York YO10 5DD, UK, WILLIAM GRAHAM, KARI NIEMI, Centre for Plasma Physics, Queen's University Belfast, Belfast BT7 1NN, UK, DEBORAH O'CONNELL, York Plasma Institute, Department of Physics, University of York, York YO10 5DD, UK — We investigate the electron dynamics in a planar inductively coupled plasma (ICP) with an RF capacitive bias on the counter electrode. Various sinusoidal frequencies are applied to the bias electrode. Diagnostics used are current and voltage probe along with phase and space resolved optical emission spectroscopy (PROES). The measurements reveal that the RF bias has significant influence on the dynamics of the electrons in the plasma. In addition to inductive heating twice in each RF cycle, energetic electrons originate in front of the ICP antenna causing excitation once in each RF cycle. Fourier analysis of the time resolved excitation distinguishes the contribution of the different excitation mechanisms and their spatial structures. By tuning the phase between the bias and the ICP waveforms, these excitation contributions can be enhanced or suppressed. This may offer possibilities for improving radial uniformity.

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