Abstract Submitted
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Design and experimental implementation of real time closed loop control of plasma processes[1] BERNARD KEVILLE, NCPST, School of Physical Sciences, Dublin City University, MILES TURNER, NCPST, School of Physical Sciences, DCU, YANG ZHANG, School of Electronic Engineering, DCU, STEPHEN DANIELS, NCPST and School of Electronic Engineering, DCU, ANTHONY HOLOHAN, School of Electronic Engineering, DCU — Ostensibly identical plasma etching chambers running the same recipe may produce different results. "Chamber matching," which entails ex situ statistical analysis and consequent adjustment to ensure acceptable results, is costly and time consuming. In addition, a matched chamber may be subject to real-time disturbances which compromise reproducibility. Effective closed loop control of important reactive plasma species may obviate the need for chamber matching and mitigate the deleterious effects of disturbances. This work indicates how a control algorithm may be derived given a dynamic, control-oriented process model and closed loop specifications. Experimental implementation of the algorithm on a capacitively coupled plasma chamber is described. Finally, control of oxygen and fluorine radicals in an argon/oxygen/fluorocarbon plasma simulation is considered.

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