

Abstract Submitted  
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**Model and Measurements for Closed Loop Control of an Inductively Coupled Plasma Source** BERNARD KEVILLE, PETAR IORDANOV, DECLAN DOHERTY, National University of Ireland, Maynooth, Ireland, MICHAEL B. HOPKINS, RONAN FAULKNER, Dublin City University, Ireland — Process analysis and design and simulation of closed loop control algorithms require lumped parameter or low order models of plasma sources which reveal the essential dynamics of the system. Empirical models do not facilitate the simulation of process disturbances and hence an approach based on first principles is preferable. A physically-based, control-oriented model consisting of a global model of the plasma chemistry, together with a model of power deposition and models of the mass flow controllers and throttle valve has been used in the design and simulation of closed loop control algorithms for an inductively coupled plasma source with internal antenna. Multivariable closed loop control of an Argon/ Oxygen plasma has been demonstrated experimentally and the use of a number of different sensors for feedback control has been investigated.

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