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Simulations of VHF capacitively coupled discharges considering wave effects ANANTH BHOJ, MUSTAFA MEGAHED, ESI US R&D Inc — The influence of electromagnetic wave effects on the spatial distribution of power deposition and plasma density in plasma processing reactors has been a topic of great interest in recent years. These effects are particularly important for the operation of high frequency or large area reactors. The hydrodynamic plasma modeling platform CFD-ACE+ was improved to extend the model for capacitively coupled plasma discharges to incorporate wave effects. The approach used was to solve for the vector magnetic potential accounting separately for the contribution of the so-called electrostatic and electromagnetic fields to the total power deposition. The improved model can address arbitrary reactor geometries in 2D, axisymmetric or 3D and accepts user defined chemical reaction mechanisms relevant to the process. In this paper, results applying this model to a VHF reactor including the effects of varying rf power and frequency on the spatial distribution of the discharge are discussed.

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