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Parametric investigations of plasma characteristics in a remote inductively coupled plasma system PRASOON SHUKLA, ABHRA ROY, KUNAL JAIN, ANANTH BHOJ, ESI US RD, Inc. — Designing a remote plasma system involves source chamber sizing, selection of coils and/or electrodes to power the plasma, designing the downstream tubes, selection of materials used in the source and downstream regions, locations of inlets and outlets and finally optimizing the process parameter space of pressure, gas flow rates and power delivery. Simulations can aid in spatial and temporal plasma characterization in what are often inaccessible locations for experimental probes in the source chamber. In this paper, we report on simulations of a remote inductively coupled Argon plasma system using the modeling platform CFD-ACE+. The coupled multiphysics model description successfully address flow, chemistry, electromagnetics, heat transfer and plasma transport in the remote plasma system. The SimManager tool enables easy setup of parametric simulations to investigate the effect of varying the pressure, power, frequency, flow rates and downstream tube lengths. It can also enable the automatic solution of the varied parameters to optimize a user-defined objective function, which may be the integral ion and radical fluxes at the wafer. The fast run time coupled with the parametric and optimization capabilities can add significant insight and value in design and optimization.

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