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Parametric study of pressure and frequency modes in a low temperature plasma bounded by a dielectric surface JOSE MILLAN, VENKATTRAMAN AYYASWAMY, University of California, Merced — Low-temperature plasmas operating in the presence of a dielectric surface are encountered in several applications involving plasma-surface interactions. Therefore, it is crucial to obtain a better understanding of the interactions between non-thermal plasmas and dielectric surfaces. The primary goal of the current work is to obtain a better understanding of the frequency and pressure response of the operating modes of argon microplasmas ignited in a dielectric barrier discharge configuration. Specifically, one-dimensional simulations based on a continuum approach will be utilized to study microplasmas operating in high radio frequency/microwaves regimes and pressure ranging from 76 torr to 760 torr. The continuum simulations are performed by solving the full-momentum equations for ions and electrons using the plasmaFoam code developed in-house. Results will be presented for the influence of the dielectric properties on plasma properties. The one-dimensional results will be compared to representative two-dimensional simulations in order to highlight the effect of dimensionality. The results are of importance of the design of microwave plasma sources that interact with non-conducting surfaces.

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