

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Propagation and maintenance of plasma in a grounded slot and peripheral chamber connected to a capacitive discharge ALLAN LICHTENBERG, SUNGJIN KIM, MICHAEL LIEBERMAN, University of California, Berkeley — A capacitive discharge connected through a slot to a peripheral grounded pumping region is a configuration of both theoretical and practical interest. The configuration is used in commercial dual frequency capacitive discharges with one frequency higher than the usual industrial frequency of 13.56 MHz, with application to dielectric etching on large area substrates. In some configurations a dielectric slot surrounding the substrate separates the main plasma from a peripheral pumping region. Ignition of the peripheral plasma produces detrimental effects on processing performance. Discharge models for diffusion and plasma maintenance in the slot have been developed to obtain conditions for ignition of the plasma in the periphery. An experiment has been constructed to compare with and validate theoretical predictions of ignition conditions. Support provided by Lam Research, the state of California MICRO program, NSF Grant ECS-0139956, and UC Discovery Grant from IUCRP.

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Date submitted: 13 Jul 2005

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