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Characterisation of a rf micro hollow cathode discharge and its interactions with nearest neighbours SAM DIXON, ROD BOSWELL, CHRISTINE CHARLES, Australian National University, JOHN HOLLAND, WES COX, Lam Research Corporation, SPACE PLASMA, POWER AND PROPULSION LABORATORY TEAM, LAM RESEARCH CORPORATION COLLABORATION —
A novel microplasma hollow cathode plasma source of 4 mm diameter and driven by 13.56 MHz is investigated using 3D sweeps of Langmuir probes in the downstream plasma expansion region. Initial results suggest that the plasma expansion is a simple diffusion from the exit orifice of the 30 mm long cylindrical source region. By making comprehensive measurements of the plasma plumes produced by two micro hollow cathode sources separated by differing distances, the mutual interaction between these components of the system have been determined with the aim of determining whether a much larger array of sources could be envisioned. The effectiveness of the plasma in dissociating reactive species was tested using SF_6 and measuring etch patterns on unbiased silicon wafers. The results have been modeled and show that it is indeed possible to produce a uniform spread of active species over large areas.

Sam Dixon
Australian National University

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