Abstract Submitted
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Temporally-Resolved Measurements of the Ion Distribution Function in a Radio Frequency Sheath[1] WALTER GEKELMAN, UCLA Dept of Physics, BRETT JACOBS, UCLA, Dept Physics, PATRICK PRIBYL, UCLA Dept of Physics, MIKE BARNES, Plasma Control Systems — The time-dependent argon ion velocity distribution function above and within the plasma sheath of a radio frequency (rf) biased substrate has been measured using laser induced fluorescence (LIF) in a commercial plasma processing tool. The measurements were acquired at eight different phases of the 2.2 MHz rf waveform and show the ion dynamics to vary dramatically throughout a cycle. Discharge parameters were such that the rf bias period was on the order of the ion transit time through the sheath ($\tau_{ion}/\tau_{rf} = 0.435$). The heat flux and plasma flow is derived from the ion distribution function. This work embodies the first time resolved measurement of ion velocity distribution functions (IVDFs) within an rf biased sheath over a large area (30 cm diameter) substrate.

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