

Abstract Submitted
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LIF Measurement of Argon in Ar-Xe Plasma Sheath Boundary with Tunable Diode Laser¹ DONGSOO LEE, NOAH HERSHKOWITZ, Dept. of Engineering Physics, University of Wisconsin-Madison, GREG SEVERN, Dept. of Physics, University of San Diego — The Bohm sheath criterion in single and two-species plasma is studied with Laser-Induced Fluorescence (LIF) using a diode laser. Xenon is added to a low pressure unmagnetized dc hot filament argon discharge confined by surface multipole magnetic fields. The Ar II transition sequence at 668.614 nm is adopted for optical pumping to detect the fluorescence from the plasma and to measure the Ar ion velocity distribution function as a function of position relative to a negatively biased boundary plate. The structures of the plasma sheath and presheath are measured by an emissive probe. The ion concentrations of the two-species in the bulk plasma are calculated from measured ion acoustic wave phase velocity. The measured phase velocity data combined with the argon LIF data is used to determine the Xe ion velocity. Results are also compared with previous experiments with Ar-He plasmas in which the Ar ions were the heavier ion species [1].

[1] G.D. Severn et al, Phys. Rev. Lett., 90, 145001 (2003).

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