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Is Bohm's Criterion satisfied in a weakly ionized Kr discharge, in the vicinity of a biased grid that permits counter streaming ion flow?¹ EUGENE WACKERBARTH, Dept. Physics & Biophysics, University of San Diego, IN-JE KANG, IN-SUN PARK, KYU-SUN CHUNG, Dept. Electrical Engineering, Hanyang University, Seoul, Republic of Korea, NOAH HERSHKOWITZ, Dept. Engineering Physics, University of Wisconsin-Madison, GREG SEVERN, Dept. Physics & Biophysics, University of San Diego — We consider the problem of the sheath near a negatively biased grid (-100V) that permits ion flow in both directions. We show the first laser-induced fluorescence (LIF) measurements of ion velocity distribution functions (IVDFs) in such a system. We worked with a hot filament discharge at the University of San Diego (length = 64 cm, diameter = 32 cm) in which a Kr discharge was operated with a neutral pressure of 0.1mTorr, $n_e \approx 3 \times 10^9 cm^{-3}$ and $T_e \approx 3.5 eV$. Sheath potentials were measured with an emissive probe using the inflection point method in the limit of zero emission. The LIF collection optics were recently upgraded to a 4f system with a spatial resolution smaller than 1mm. IVDFs measured near the grid (80mm diam. 40 lines/cm) indicate ion flow from both sides of the grid. Preliminary analysis of the moments of the IVDFs indicate that Bohm's Criterion is satisfied at the sheath edge.

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