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Plasma Potential Profiles Near a Thin Cylindrical Wire[1] LUTFI OKSUZ, Suleyman Demirel University, NOAH HERSHKOWITZ, UMAIR M SIDDIQUI, University of Wisconsin Madison, ALI GULEC, Suleyman Demirel University — Although there are many experimental and theoretical works measuring plasma potential profiles near planar boundaries, there is little experimental data on the sheath and presheath of surrounding cylindrical wires. This paper presents experimental measurements of plasma potential profiles in the radial direction, perpendicular to a long (50 cm) and thin diameter (0.5 mm) circular stainless steel wire. Measurements were made using the inflection point in the limit of zero emission technique in an argon plasma in a multi-dipole dc hot filament device. Planar Langmuir probes were used to measure the plasma properties far from the sheath boundary. Sheath and presheath characteristics of the cylindrical geometry were examined for different Debye lengths and energy of the electrons emitted from the filaments.

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