

Abstract Submitted
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Investigating the plasma sheath above a circular trench using dust ANDREW A. KURTZ, WILLIAM L. THEISEN, T. E. SHERIDAN, Ohio Northern University — We study the plasma sheath above a circular trench in a flat, round cathode using dust particles that float at the sheath edge and form a flat dust ring. In these experiments the outer radius of the trench can be easily changed without disrupting the plasma or dust ring, allowing us to characterize the sheath edge geometry for different trench widths. Images of the dust ring were analyzed to determine the sheath width and the radius of the lowest potential energy surface. Videos of two dust particles are used to measure the transverse oscillation frequency, which gives the curvature of the sheath edge. We find that for larger trench widths the dust ring is closer to the electrode and the transverse frequency decreases. Decreasing the trench width, up to a certain point, causes the ring to move higher and increases the transverse frequency. If the trench width is too small then the sheath edge is expelled from the trench and the dust ring becomes a circular dust cluster.

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