

Abstract Submitted  
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**Sensitivity Analysis on Boundary Conditions for Continuum Regime Probe** H.L. RAPPAPORT, Enig Associates — In both classic literature on the continuum regime Langmuir probe [1], and recent literature on dust grain charging [2], the assumption is made that the electron and ion densities vanish on the probe surface. This implies a singularity in the respective fluid velocities at the surface under steady state conditions. Our recent kinetic simulations [3] of electrons near the surface of a planar probe, showed that reasonable electron boundary conditions require the electron density at the probe surface be on the order of the equilibrium density times the ratio of the electron drift velocity over the thermal speed. Density does not vanish, nor does temperature remain constant, as the surface is approached. In this poster, a sensitivity analysis on spherical probe current and potential is performed to investigate how changes in electron and ion boundary conditions affect results.

- 1) C.H. Su and S.H. Lam, Phys. Fluids, Vol. 6, No. 10, 1963; I.M. Cohen, Phys. Fluids, Vol. 6 No. 10, 1963.
- 2) S.A. Khrapak, G.E.Morfill, A.G. Khrapak, L.G. D'yachkov, Phys. Plasmas, Vol. 13, No. 5, 2006.
- 3) H.L. Rappaport, presented at APS/DPP 2006.

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