

Experimental measurements for the floating potentials of dust and spacecraft in plasma

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We present experimental measurements of the floating potentials of spherical probes, used as a model of dust or spacecraft, in a plasma with a wide range of the Debye length with respect to the radii of the probes. Our experimental results show that the probe floating potential changes as a function of the Debye length. It is shown that, in an argon plasma with the ion to electron temperature ratio ~ 0.01 , the magnitude of the floating potential becomes approximately twice larger when the Debye length changes from larger to smaller than the probe radius. We experimentally validate the theoretical predictions across the regimes of the orbital motion limited (OML), thin sheath (TS) and transition.