

Means to avoid the contamination effect of Langmuir probe measurement for ionosphere studies

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Some scientists are still not aware of the serious effect of electrode contamination in Langmuir probe experiments in space, or they do not take any action for that even though they are aware of the seriousness. We stress here that one should pay extra small attention to the electrode contamination to get accurate and reliable parameters, by which the long time effort for sounding rocket/satellite mission does not end in vain. In this paper we describe two main features of voltage-current characteristic curves associated with contaminated Langmuir probe, which are predicted from equivalent circuit model which we proposed in 1970's. We then show that that fast sweep DC Langmuir probe can give reliable result in steady state regime. The first sweep probe can also give a reliable result in transient situation such as the passing through plasma bubble in the ionosphere where electron density suddenly changes, after the several sweep cycle of the probe voltage. This fact is first confirmed through Laboratory experiment.

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