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Analysis of Particle Detectors in Plasma Sheaths on Sounding Rockets and in Laboratory Plasmas LISA FISHER, KRISTINA LYNCH, Dartmouth College — The influence of plasma sheaths on particle measurements is a well-known problem. Improvements in computational speed and memory have made the use of particle-in-cell codes, attainable on a laptop. These codes can calculate complex sheath structures and include most of the relevant physics. We will discuss how the use of one such code, SPIS, has been integrated into our data processing for the MICA sounding rocket. This inclusion of sheath physics has allowed us to describe the current-voltage signature of an ion retarding potential analyzer, called the PIP, to measure the ambient ionospheric temperature, as well as to examine the possibility of ion upflow. These results will be compared with the other instrumentation on MICA, which use traditional thin-sheath approximations. This comparison will emphasize the strengths and weaknesses of these other data analysis methods and call attention to the need to include sheath physics when measuring very low energy populations. Additionally, these instruments have also been tested in the Dartmouth College plasma facility. This provides another set of plasma conditions for testing and extrapolating our method to a future low-orbit mission.

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