



Rosetta spacecraft potential measurements at Earth and Mars

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As the electrostatic potential of an object in space depends on the number density of the plasma, measurements of the spacecraft potential are commonly used for determining the plasma density and its variations at high time resolution. The Rosetta spacecraft, en route to comet 67P/Churyomov-Gerasimenko for arrival in 2014, carries a set of plasma instruments known as the Rosetta Plasma Consortium (RPC), among them a Langmuir probe instrument (LAP) for studies of the cometary plasma environment. We here present LAP measurements of the probe-to-spacecraft potential during the Rosetta flybys of Earth and Mars in 2007, together with model interpretations in terms of true spacecraft potential and plasma density, calibrated by use of simultaneous data from ACE and Mars Express, and supporting RPC measurements. Plasma density structures like the bow shocks and magnetopause/magnetic pileup boundary show clearly in the data and are compared to magnetic field and particle data.