



First electric field measurements from the plasma environment of comet 67P/Churyumov-Gerasimenko

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We present the first electric field measurements from the plasma environment of comet 67P/Churyumov-Gerasimenko, performed by the Rosetta dual Langmuir probe instrument LAP. For two time intervals, measurements of the electric field from cometocentric distances of 149 and 348 km are presented together with estimates of the spacecraft potential, which can be used as an indicator of plasma density changes. Persistent wave activity around the local water ion lower hybrid frequency (determined from the magnetic field measurements from the fluxgate magnetometer MAG) is observed. The largest amplitudes are observed at sharp plasma gradients. We discuss the probability that these waves are excited by the lower hybrid drift instability (LHDI), and conclude that the necessary requirements for the LHDI to be operating are fulfilled. We also present first statistical results of the electric field measurements, showing that the wave activity is concentrated to certain regions of the comet, and varies with heliocentric distance. We also discuss the possible effects the waves have on the ambient plasma, and suggest that they may explain hot plasma populations.