



Charging effects on Rosetta dust measurements

Mihaly Horanyi (1), Jan Deca (1), Eberhard Gruen (2), and Ove Havnes (2)

(1) U. of Colorado, LASP, Physics, Boulder, United States (horanyi@colorado.edu), (2) U. of Tromso, Norway

Dust particles released from the comet 67P/Churyumov-Gerasimenko collect electrostatic charges. Their motion is influenced by the electric fields induced by the flow of the solar wind and by the charging of the spacecraft. Dust grains with sufficiently low tensile strength might even be destroyed en route from the nucleus to Rosetta. A simple model of the plasma environment is discussed here to enable simultaneously following the charging and the dynamics of dust particles as function of the heliocentric distance of the comet, the distance between Rosetta and the nucleus, the asymmetry in gas production between the northern and southern hemispheres of the nucleus, and the amplitude and timing of possible outbursts intermittently increasing the production rate of the comet. The electrostatic disruption, and the combination of attractive and repulsive forces between the dust grains as they approach Rosetta might significantly alter the conclusions about the size and spatial distributions of dust grains released from 67P/Churyumov-Gerasimenko. These calculations are presented to help assess the effects of dust and spacecraft charging in the analysis and interpretation of dust measurements by Rosetta.