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SPACE EXPLORATION SYMPOSIUM (A3)
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LANDING PREPARATIONS FOR THE ROSETTA COMET LANDER, PHILAE

Abstract

Rosetta is a Cornerstone Mission of the ESA Horizon 2000 programme. It is going to rendezvous with comet 67P/Churyumov-Gerasimenko (CG) after a 10 year cruise and will study both its nucleus and coma with an orbiting spacecraft as well as a landed platform. The latter, named Philae, has been designed to land softly on the comet nucleus and is equipped with 10 scientific instruments to perform in-situ studies of the cometary material.

The delivery of Philae to the comets surface is connected to several challenges: Currently the characteristics of the nucleus of the comet are hardly known. Mapping and crucial measurements like gravity field, state of rotation or outgassing parameters can only be performed after arrival of the Rosetta main spacecraft in May 2014. These data will be used for selecting a landing site and for defining the detailed landing strategy. Landing is currently foreseen for November 2014 at a heliocentric distance of 3 AU. The cometary environment by itself is difficult to cope with, considering uncertainties in possible surface characteristics (e.g. surface strength or local topography) as well as the gas environment in the coma (affecting the precision of navigating the spacecraft).

The paper will address the preparatory work for Lander delivery performed e.g. with a ground reference model, the strategy how to finalize a separation, descent and landing scenario as well as on comet operations timeline on the basis of space-borne data by the Rosetta orbiter instruments.