SPACE EXPLORATION SYMPOSIUM (A3)
Small Bodies Missions and Technologies (4)

Author: Mr. Andrea Accomazzo
European Space Agency (ESA), Germany, Andrea.Accomazzo@esa.int

Dr. Paolo Ferri
European Space Agency (ESA), Germany, paolo.ferri@esa.int
Mr. Sylvain Lodiot
European Space Agency (ESA), Germany, Sylvain.Lodiot@esa.int
Mr. Jose-Luis Pellon-Bailon
European Space Agency (ESA), Germany, jose-luis.Pellon.Bailon@esa.int
Ms. Armelle Hubault
Telespazio VEGA Deutschland GmbH, Germany, armelle.hubault@esa.int
Mr. Jakub Urbanek
Telespazio VEGA Deutschland GmbH, Germany, jakub.urbanek@esa.int
Mr. Ritchie Kay
LSE Space GmbH, Germany, ritchie.kay@esa.int
Mr. Matthias Eiblmaier
SCISYS Deutschland GmbH, Germany, Matthias.Eiblmaier@esa.int
Mr. Tiago Francisco
Telespazio VEGA Deutschland GmbH, Germany, Tiago.Francisco@esa.int
Mr. Andreas Rudolph
European Space Agency (ESA), Germany, Andreas.Rudolph@esa.int

THE FINAL YEAR OF THE ROSETTA MISSION

Abstract

The International Rosetta Mission was launched on 2nd March 2004 on its 10 year journey to rendezvous with comet 67P Churyumov-Gerasimenko. Rosetta performed comet orbit insertion on the 6th of August 2014, after which it characterised the nucleus and orbited it, performing scientific measurements and observations from altitudes as low as a few kilometres. In November 2014 Rosetta delivered the lander Philae to perform the first soft landing ever on the surface of a comet. After this critical operation Rosetta escorted the comet throughout its orbit around the Sun, passing the perihelion in August 2015, and then heading again towards the aphelion. During these months Rosetta monitored the reduction of the comet's activity due to the increasing Sun distance and the effects of the perihelion passage on its surface and activity characteristics. With the reduced activity Rosetta could fly again in proximity of the nucleus giving the scientists a second chance for measuring the comet environment and its evolution from close distances. Rosetta will be again in a position to fly closed orbits as of spring 2016 and will continue approaching the nucleus till August 2016 when a final series of very close orbits will be flown; it is expected that it will be possible to fly at altitudes below 1 km from the comet's surface. Throughout October 2016 Rosetta and the comet will be in superior conjunction with the Sun and the Earth, preventing ground contact and all operations. After the conjunction period the spacecraft's heliocentric distance will be such that not enough power can be generated to keep the spacecraft systems active. Therefore the mission will be terminated by the end of September , when Rosetta will be manoeuvered to a collision course with the surface of the comet.. This paper will report the details of the last 12 months of flight including the

second approach phase and the final phase of close orbits leading to the end of the mission.