

Comet 67P/Churyumov-Gerasimenko mass estimation from CONSERT ranging data

Mao Ye (1,2), Jean-Pierre Barriot (1), Wlodek Kofman (3), Alain Herique (3), Yves Rogez (3), Fei Li (2), and Jianguo Yan (2)

(1) Observatoire Géodésique de Tahiti, Tahiti, French Polynesia, (2) State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan, China, (3) Institut de Planétologie et d'Astrophysique de Grenoble/Univ, Grenoble, France, (mye@whu.edu.cn)

Abstract

The Philae lander on the surface of comet 67P/C-G was finally imaged by the OSIRIS camera onboard the Rosetta spacecraft on September 2, 2016. In this study, we derive an estimate of the mass of the comet from the three CONSERT measurement sequences taken in direct visibility from the lander to the orbiter, and compare it with the mass estimate derived from radio-tracking data of the Rosetta spacecraft from the Earth[1][2]. We also derive updated 3D coordinates for the lander, by taking into account the shape of the comet as a constraint and the 2D a priori coordinates from the OSIRIS images[3].

Acknowledgements

Support from the Centre National d'Etudes Spatiales (CNES, France) is acknowledged. The CONSERT instrument was designed, built and operated by IPAG, LATMOS and MPS and was financially supported by CNES, CNRS, UGA, DLR and MPS. We thank Rosetta radio science team and CONSERT team for providing precious observation data.

References

- [1] Kofman W., et al., (2015) Science. 349,020639. [2] Alain, H., et al., (2015) Planet. Space Sci. 117, 475-484. [3] Stephan U., et al., (2017) Acta Astronautica. 137, 38-43.