



**HAL**  
open science

## The volatile inventory of comet 67P/Churyumov-Gerasimenko from Rosetta/ROSINA at 3 AU

L. Le Roy, K. Altwegg, Jean-Jacques Berthelier, A. Bieler, C. Briois, U. Calmonte, M. R. Combi, J. de Keyser, F. Dhooghe, B. Fiethe, et al.

### ► To cite this version:

L. Le Roy, K. Altwegg, Jean-Jacques Berthelier, A. Bieler, C. Briois, et al.. The volatile inventory of comet 67P/Churyumov-Gerasimenko from Rosetta/ROSINA at 3 AU. European Planetary Science Congress 2015, Sep 2015, Nantes, France. insu-03576016

**HAL Id: insu-03576016**

**<https://insu.hal.science/insu-03576016v1>**

Submitted on 16 Feb 2022

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

## The volatile inventory of comet 67P/Churyumov-Gerasimenko from Rosetta/ROSINA at 3 AU

L. Le Roy (1), K. Altwegg (1, 2), J.J. Berthelier (3), A. Bieler (4), C. Briois (5), U. Calmonte (2), M. R. Combi (4), J. De Keyser (6), F. Dhooghe (6), B. Fiethe (7), S.A. Fuselier (8), S. Gasc (2), T.I. Gombosi (4), M. Hässig (8), A. Jäckel (2), M. Rubin (2), and Chia-Yu Tzou (2)

(1) Center for Space and Habitability (CSH), University of Bern, Switzerland, (2) Space Research and Planetary Sciences, University of Bern, Switzerland, (3) Laboratoire Atmosphères, Milieux, Observations Spatiales (LATMOS), Univ. Pierre et Marie Curie, Univ. Versailles Saint-Quentin & Centre National de la Recherche Scientifique, Paris, France, (4) Department of Atmospheric, Oceanic and Space Science, University of Michigan, Ann Arbor, MI, USA, (5) Laboratoire de Physique et Chimie de l'Environnement et de l'Espace, LPC2E, CNRS 7328 /Université d'Orléans, 3A av. de la Recherche Scientifique, 45071, Orléans, France (6) Space Physics Division, BIRA-IASB, Brussels, Belgium, (7) Institute of Computer and Network Engineering, TU Braunschweig, Braunschweig, Germany, (8) Southwest Research Institute, San Antonio, Texas, USA,

(lena.leroy@csh.unibe.ch / Fax: +41 (0)31 631 44 05)

### Abstract

Comets are believed to be the most pristine bodies in the solar system. The study of their composition can therefore give us important clues about the processes that occurred during the solar system formation. We will report abundances of the major observed species with focus on the hydrocarbons detected by ROSINA/DFMS in the coma of 67P/Churyumov-Gerasimenko in October 2014 at 3 AU.

abundance reported for other comets such as 103P/Hartley 2, 1P/Halley, Hale-Bopp, Hyakutake, and also to the composition in the interstellar medium.

### References

Balsiger H., Altwegg K., Bochsler P., et al. 2007, Sp. Sci. Rev., 128, 745.

## 1. ROSINA experiment

ROSINA consists of a suite of three instruments: a pressure sensor (COPS: COMetary Pressure Sensor) and two mass spectrometers: the Reflectron Time of Flight mass spectrometer (RTOF) and the Double Focusing Mass Spectrometer (DFMS).

For this study, the data have been obtained with the high-resolution mass spectrometer DFMS, a traditional magnetic mass spectrometer that combines an electrostatic analyzer for energy analysis with a magnet for momentum analysis. Its mass resolution is 9000 at FWHM at 28 u/e, which allows to resolve CO from N<sub>2</sub> at m/z= 28 u/e [1].

## 2. Objective

In October 2014, before lander release, the Rosetta spacecraft trajectory around the nucleus was in the terminator plane at different distances from the nucleus. This study focuses on the parent species detected during the 10 km orbit. The abundance/detection of the different parent species will be presented and compared to the