

# The early cometary activity of 67P/Churyumov-Gerasimenko: Preliminary results seen with Rosetta/ROSINA

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## Abstract

The Rosetta spacecraft launched in March 2004 to comet 67P/Churyumov-Gerasimenko (67P/CG) is finally approaching its target comet. In the comet characterization phase lasting from Aug 1 until Sep 2, 2014, Rosetta's distance to comet 67P/CG is going to be between 1'000 to 100 km at a heliocentric distance of about 3.6 to 3.4 AU. One out of 11 orbiter experiments is ROSINA, the Rosetta Orbiter Spectrometer for Ion and Neutral Analysis that is going to measure the composition of comet 67P/CG's atmosphere and ionosphere, and additionally measures the velocities of gas particles [1].

## 1. ROSINA

ROSINA consists of two mass spectrometers with complementary capabilities: the double focusing mass spectrometer (DFMS) and the reflectron time of flight mass spectrometer (RTOF), for the analysis of neutral gas particles and primary ions in the cometary coma of the comet. ROSINA is completed by the cometary pressure sensor (COPS) which measures the total neutral particle density and the radial flow velocity of the gas.

## 2. ROSINA Measurements

All three ROSINA instruments were successfully switched on in April/May 2014. This first commissioning phase was followed by mainly background measurements, combined measurements with other orbiter, resp. lander experiments and by fine-tuning adjustments of the ROSINA instruments.

## 3. Goal of this study

From beginning of August, ROSINA is going to continuously monitor the gaseous composition. The goal of this work is not only to determine the ratio of CO<sub>2</sub> to H<sub>2</sub>O and CO to H<sub>2</sub>O, but also to analyse these ratios as a function of the heliocentric distance. The ROSINA experiment is dedicated to characterize the evolution of the cometary activity from the very beginning by direct observations of gas phase species like H<sub>2</sub>O, CO<sub>2</sub> and CO. We will present the first mass spectra of RTOF and the first gas flow velocity measurements of COPS on these molecular compositions obtained at 67P/CG.

## References

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