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# Derivation of gas and dust surface fluxes on comet 67P

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In August 2014 the ESA Rosetta space probe approached less than 100 km to the nucleus of comet 67P/Churyumov-Gerasimenko (67P), when it was at 3.00 AU from the Sun. During the following several months it gathered information on the dusty-gas atmosphere in the immediate vicinity of the nucleus.

We describe the models developed to predict the gas and dust environment of comet 67P and their methods of adjustment to the observational data obtained by Rosetta before its lander Philae landed on 67P surface.

Ideally speaking, the optimization of the gas model would have resulted from a succession of predictions of the local gas parameters along optimal Rosetta trajectories, as well as of the gas parameters inside the field-of-view of the remote-sensing instruments, followed by the comparison with the in-situ and remote-sensing instruments data. This turned out to be impossible for many reasons. Actually, predefined Rosetta trajectories and instrument view directions turned to be non-optimal for adjusting the model parameters. Therefore, we focused on: (1) fitting the measurements performed by the Rosetta Orbiter Spectrometer for Ion and Neutral Analysis (ROSINA) [1] with the gas model, and (2) fitting the dust coma images acquired by the Optical, Spectroscopic, and Infrared Remote Imaging System (OSIRIS) [4], taking into account the dust size distribution (see [3]) obtained by the Grain Impact Analyser and Dust Accumulator (GIADA) [2], with our dust model.

We present the resulting distribution of gas and dust fluxes over 67P surface.

## References

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