

First OSIRIS observations of active areas on comet 67P

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Abstract

After a successful exit from hibernation, Rosetta started observing its final target comet 67P in March 2014 with the two OSIRIS cameras WAC and NAC (Wide Angle and Narrow Angle Camera) [1]. By the time of this conference, the spacecraft will have flown from 5 million to 50 km from the nucleus surface, reaching a resolution of 1 meter/pixel in the NAC images.

During that period, the comet heliocentric distance varies from 4.3 to 3.2 AU and we will observe how the early activity develops.

We know that cometary surfaces are not fully active; only a small fraction of the surface emits gas and dust. However we do not yet understand why it happens in that way, and what to expect on 67P. Recent publications using data from ground-based telescopes have proposed different interpretations for the distribution of active sources, from one to three at various latitudes [2, 3]. There is some evidence for different levels of activity in the northern and southern hemispheres, but these variations can only be constrained with close range data.

In August 2014, OSIRIS will map the surface of the comet at high resolution, and perform weekly monitoring of the activity, especially the faintest jets. With these images and the inversion code COSSIM [4], we will be able to link observed features in the coma or on the limb to physical spots on the surface.

On other comets visited by spacecrafts the activity has sometimes been associated with smooth areas, rough terrains, or specific morphologic features (cliff, crater, rim, ...). We will present a first look at how activity and terrain are linked on 67P, and look at variations of composition, morphology, or both. We will compare this identification of active areas to previous publications.

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