

### Grains around Comet 103P/Hartley 2 at the time of the EPOXI fly-by

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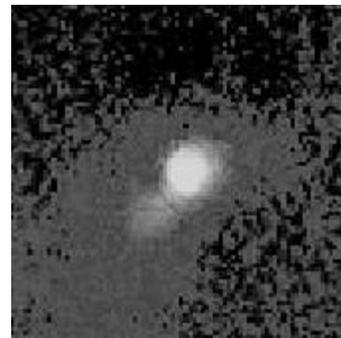
Comet 103P/Hartley 2 was observed during 5 nights in November 2010, at the time of the fly-by of the *EPOXI* space probe. The goal of the observations was to connect the small scale phenomena observed from the spacecraft, with the large scale ones observed from the ground.

The spacecraft observed at least two active regions on the nucleus, which emitted different material: one rich in CO, and the other in water. The spacecraft observed also a large number of large grains around the nucleus: ice particles, “snow balls”, that contributed most of the water production rate.

From the ground, the comet showed a strong activity, periodic with the nucleus rotation. We report here on the characterization of this periodic activity. It was observed through IHW-like *Rc* and *Bc* filters measuring the continuum emission. The observations were performed on the ESO 3.6-m New Technology Telescope on La Silla, Chile, with EFOSC.

We conclude that the periodic activity produced grains in two privileged directions, and that these grains had a lifetime of the order of 5 hours, compatible with the observations of the “snow balls” detected by the spacecraft.

While the grains from one active region appear gray, compatible with pure ice, the grains produced by the other region have a very red color, incompatible with pure ice. Those grains should be then made by dirty ice, with lot of dust and organic matter, or simply made by organic grains.



**Comet 103P/Hartley 2.** Continuum emission through the *Bc* filter. The component of the coma that is constant over time has been removed, to reveal the periodic activity. The top panel shows the first activity region, pointing toward  $PA \sim 80^\circ$ , the lower panel, the second one, pointing toward  $PA \sim 140^\circ$ . N is up, E is left, each image covers a field of view of  $2000 \times 2000$  km at the comet.

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