Thermal Observations of Comet Wild 2 (Mission Support!)

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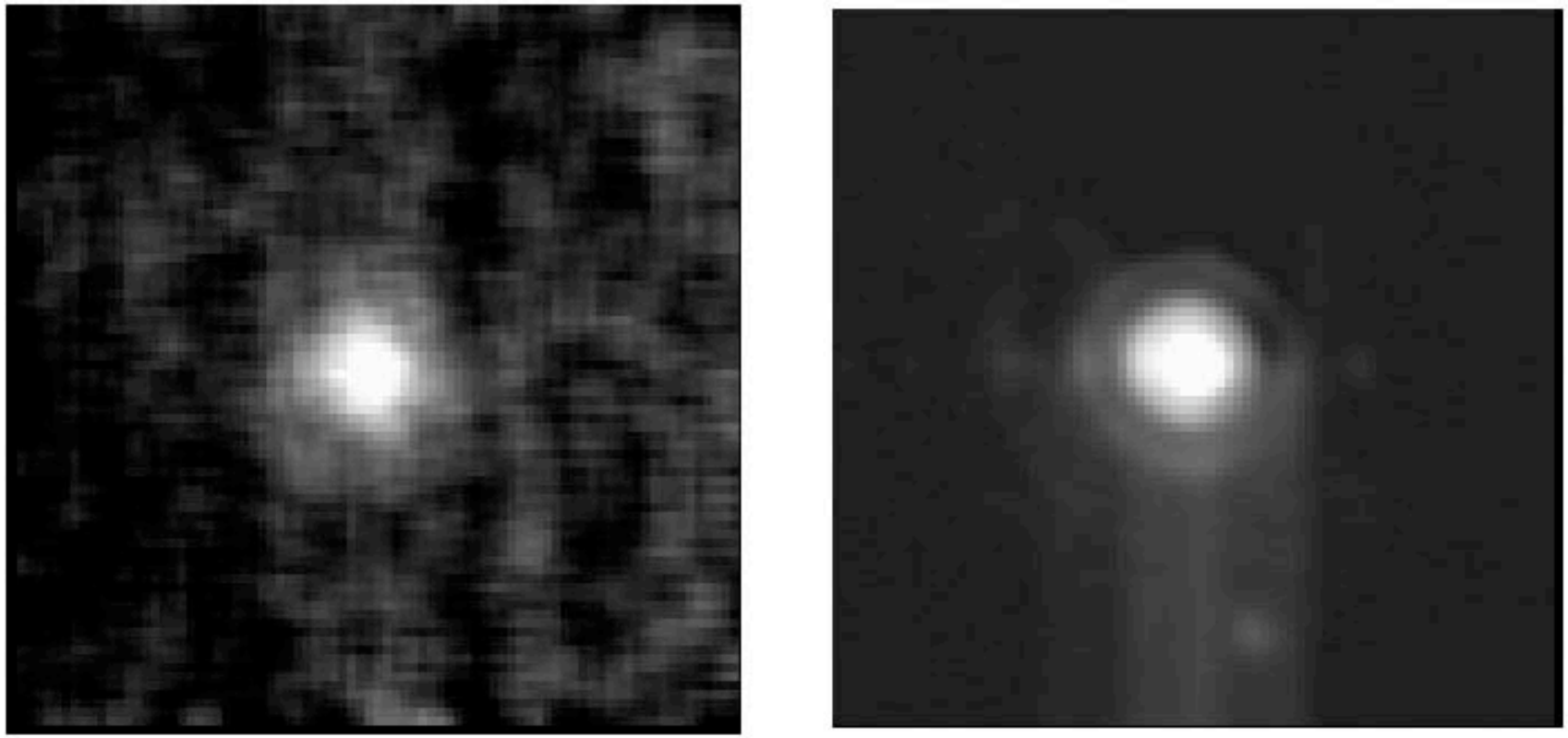
At the request of NASA Headquarters we observed comet Wild 2 at 11.7 microns on Dec. 14 and 15 using MIRLIN. The reason for this request was that the last thermal measurements of Wild 2 were made in 1997 by Hanner and Hayward. Since the StarDust spacecraft was planned to flyby at a distance of 300 km, there was concern about the spacecraft safety if the comet activity was higher than expected.

Fortunately the comet transited about 9:30 AM, and we were able to obtain our observations without taking time away from nighttime observers. The solar elongation was 25 degrees and the declination of the comet was -17^{o}.



11.7 micron image of the comet and a standard star (alpha Boo). The FWHM of the standard is 1.1 arcsec and that of the comet is 1.8 arcsec. Therefore the extended coma was detected.

Results

Scaled to the 1997 observations with the same heliocentric and Earth-to-comet distance that we had on Dec. 14-15, the 11.7 micron flux was the same as that observed in 1997. We can say with some confidence that it is no brighter than in 1997.

Based on this information and additional astrometry observations from Keck, the spacecraft flyby distance was adjusted to 240 km from the nominal 300 km, thus maximizing the dust collection efficiency and spatial resolution on the nucleus of the comet. Thankfully the spacecraft survived the flyby.