



Temporal and compositional variation of jets activity in comet Hartley 2 as observed by Deep Impact

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Abstract

On 4th November 2010, the Deep Impact spacecraft successfully flew-by comet 103P/Hartley 2 at a distance of 700 km. Onboard the spacecraft, two cameras and one infrared spectrometer [1] monitored the coma several weeks before and after closest approach. In this paper we report on the temporal variations of CO₂ (4.3 μm), H₂O (2.7 μm) and also the combination of dust and water ice particles. We focus our study at closest approach ±10 days where the ratio CO₂/H₂O is seen to vary by a factor of 2 [2]. Given the orientation of the nucleus, this variation in the ratio suggests that the ratio CO₂/H₂O is not the same at different locations with one end richer in dry ice than the other. Broadband photometry in visible wavelengths is in phase with the two gaseous species. The CO₂ and dust/ice grains are highly correlated, emphasizing the role of CO₂ jets in brining water ice and dust into the coma.

[1] Hampton et al., An overview of the instrument suite for the Deep Impact mission, Space Sci. Rev. 117

[2] A'Hearn et al., EPOXI at comet Hartley 2, Science, in press