

Production Rates and Distribution of 103P/Hartley 2's Gaseous Coma

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Abstract

The Deep Impact flyby spacecraft made its closest approach (700 km) to comet 103P/Hartley 2, the target of the Deep Impact eXtended Investigation (DIXI) mission, on November 4th, 2010 [1]. The HRI-IR spectrometer [2] monitored the coma throughout the encounter acquiring frequent spectral scans from 1.05—4.85 μ m. Gaseous H₂O and CO₂ at 2.7 μ m and 4.3 μ m, respectively, were the dominant emission bands detected in these spectra and the distribution of these parent species was determined to be highly asymmetric [3]. There is more CO₂ escaping this comet than other Jupiter Family comets, including Tempel 1 [4], the primary target of the Deep Impact mission. We will present continuing analysis of the coma asymmetries, composition, and production rates as well as their two-month evolution around perihelion, in order to better understand the chemistry of the near-nucleus coma, the heterogeneity of the outgassing of the nucleus, the source regions of the outgassing and the processes that drive the activity on Hartley 2.

[4] Feaga, L. M., et al.: Asymmetries in the distribution of H₂O and CO₂ in the inner coma of Comet 9P/Tempel 1 as observed by Deep Impact, *Icarus*, 190, pp. 345-356, 2007.

References

[1] A'Hearn, M. F., et al.: EPOXI at Comet Hartley 2, *Science*, in press, 2011.

[2] Hampton, D. L., et al.: An Overview of the Instrument Suite for the Deep Impact Mission, *Space Science Reviews*, 117, 43-93, 2005.

[3] Feaga, L. M., et al.: Heterogeneity of Comet 103P/Hartley 2's Gaseous Coma, 42nd Lunar and Planetary Science Conference, 7-11 March 2011, Houston, TX, 2011.