



High-contrast observations of the Haumea system

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Abstract

The trans-Neptunian 136108 Haumea is one of the most intriguing bodies among the population of Kuiper-Belt objects. Several of its “features” strongly suggest that it has been subject to a dramatic collision in its history: Fast rotation period, oblong shape, presence of two close satellites, Haumea itself being the largest member of a dynamical family characterized by water-ice rich surfaces (e.g. [1], [2], [3], [4]). A detailed analysis of its multi-color light-curves also suggests the presence of a geological unit displaying a different albedo and spectral response than the rest of its surface [5].

In this contribution, we report spectro-imaging observations of all three components of the Haumea system performed in 2007 with the ESO-VLT near-infrared integral-field spectrograph SINFONI and its Laser Guide Star Facility [6]. Our data and related compositional modeling show that the surface of the outer satellite Hiiaka is mostly coated with crystalline water ice, as in the case of the central body Haumea [7], [8], whose surface appears to be made of large grains of water ice, almost entirely in its crystalline form. We also discuss possible sources of heat to maintain water in its crystalline state. Finally, we report on the preliminary analysis of a similar high-contrast spectroscopic data set obtained this year on Haumea, but for a different rotational phase than our 2007 observations.

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References

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