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First observations of Ceres by VIR on Dawn mission

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The Dawn spacecraft [1] is now approaching Ceres, the second of its targets. Ceres represents the key to understand some important points relative to the role of the protoplanet size and the water content in the evolution of these bodies. Ceres is thought to be differentiated, and hydrated minerals were proposed to exist on its surface [2,3,4]. Its low density [3] associated with the presence of transient water vapour, suggests a high content of ice inside the body and on its surface. Ceres seems to have been subject to differentiation and hydrothermal activity, and might host a liquid subsurface layer even today. Dawn is equipped with a Visible and InfraRed Mapping Spectrometer (VIR-MS) [5]. VIR-MS is an imaging spectrometer coupling high spectral and spatial resolution in the VIS (0.25-1 micron) and IR (0.95-5 micron) spectral ranges.
The surface composition of Ceres is poorly understood through its nearly featureless visible spectrum. Its visible reflectance spectrum has a steep UV absorption edge that begins at a relatively short wavelength, around 0.4 micron, unlike many C-type asteroids where the UV drop-off begins around 0.6 to 0.7 micron[6]. The near-IR spectrum has a strong absorption band centered at about 3-micron. The absorption features in the 3-micron region were attributed to structural water in clay minerals [7,8] but could also be ammoniated clays [9]. [10] reported the discovery of carbonates and iron-rich clays from measurements of weak 3-micron features, and the results are consistent with the mid-IR spectra of clay minerals.
On approach to Ceres, Dawn will obtain images and hyperspectral . VIR data, with resolution larger than Hubble images will reveal the first details of the Ceres' surface composition. Here we report about the first data obtained by VIR during its approach to Ceres.

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