Geophysical Research Abstracts
Vol. 17, EGU2015-8830, 2015
EGU General Assembly 2015

Dawn approaches Ceres: Analysis of first FC color data

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Since December 1, 2014 the Dawn spacecraft obtains images of Ceres by its onboard Framing Camera in seven color bands and one clear (panchromatic) filter. The size of Ceres (in pixels) has increased during this time from a diameter of 9 pixels to about a quarter of the full frame. The higher resolution of more recent data reveals first details of the topography and distribution of reflectances. Also, we are going to show evidence on extent and elevation of impact structures and other geologic features. These are first indications on their context and unique properties of the surface and evolution of Ceres. The relationship of these features to previous resolved HST observations (Li et al., 2006) and the recent discussion on water emission activity (Küppers et al., 2014), as well as their distribution in longitude and latitude, will be discussed. The (anticipated) most recent data will be able to resolve water related features comparable with those on icy satellites. Potential consequences for the upcoming high resolution data and their planning are to be shown. The first data, obtained on Dec 1st, have been used to start studying the phase curve and to derive an integrated spectrum of Ceres (17 co-registered pixels around the center of the disk). The data were integrated to a single spectrum between 0.44 μm and 0.96 μm. The spectrum is essentially flat over all bands within the accuracy of the data ($\pm$ 0.01 in reflectance). It is consistent with previous Earth based spectra (Vilas and McFadden, 1992, Burbine et al., 2002, Li et al., 2006). Potential sites showing spectral absorption features in the visual wavelength range will be discussed. The distribution of reflectances at positions relative to the sub-solar longitude also confirms the expected extrapolation of the phase curve from ground based observations. A comparison of the observed phase effect and detected surface features will be presented. Thus differences of the surface roughness on different size scales can be discussed. They are related to presumed effects like relaxation associated with a potential subsurface water regime of Ceres.

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