High resolution Cassini-VIMS mosaics of the icy satellites of Saturn

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The Visual Infrared Mapping Spectrometer VIMS onboard the CASSINI spacecraft obtained new spectral data of the icy satellites of Saturn after its arrival at Saturn in June 2004. VIMS operates in a spectral range of 0.3 and 5.1 µm, generating image cubes in which each pixel represents a spectrum consisting of 352 contiguous wavebands.

VIMS consists of two separate optical systems, the visible channel VIMS-V and the infrared channel VIMS-IR. VIMS-V acquires its data in "push-broom"-mode and views one row of a square scene at a time. VIMS-IR uses a linear array detector in order to acquire its data in "whiskbroom" mode, where it views only one single spatial pixel per exposure. Each of these channels can operated in different modi which cause differences in size and spatial resolution of the image cubes. Therefore, image cubes which combine the spectral data of both optical systems may result in a different location of the target in the VIS-channels and the IR-channels within the image cubes.

To analyse the spectral data in a spatial way it is necessary that all 352 spectels (spectral elements) of each pixel show the same area of the specific surface. We developed an algorithm to reproject each pixel geometrically and to convert the spectral data into a map projection. The algorithm includes the mosaicking of different VIMS observations. Based on these mosaics spatial maps of the spectral properties for each satellite can be derived and can be attributed to location, geological and geomorphologic features. VIMS mosaics of the available VIMS data of the Saturnian satellites, including Titan will be presented.