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Saturn's B Ring observed by Cassini/VIMS

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Abstract

Since the Cassini orbit insertion at Saturn on july, 2004, the on-board VIMS instrument (*Visual and Infrared Mapping Spectrometer*) has collected several observations of the B ring covering a wide range of observational geometries and spatial resolutions.

The spectral range of the data (0.35-1.05 μm with the VIMS-V channel, 0.85-5.1 μm with the VIMS-IR channel) covers all the main water ice absorption bands, allowing the analysis of the spatial variations of the ice grains' spectral properties. The most part of small-scale spectral variations in the VIMS data are concentrated in the B ring, which has been observed in a variety of observational geometries [1].

Variations in size and structure of the ice component of the rings may be inferred fitting the rings reflectance by means of bidirectional spectral models of water ice. Also the presence of non-ice components may be confirmed, and their distribution analyzed. Also the B ring scattering phase functions may be reconstructed in some detail thanks to the phase angle coverage of the data at different radial distances. Several observations have been acquired at very high phase angles (with the spacecraft eclipsed by Saturn), strongly constraining the forward scattering of the rings grains.

Here we would like to report about two kinds of observations that have been more deeply analyzed: a) large-scale mosaics at different phase angles and b) small-scale sequential cubes with fixed spacecraft pointing. The latest ones have been assembled in short movies in order to stress azimuthal and/or temporal changes in reflectance of the ringlets, and eventually to identify spokes. In fact, in case of spoke detection, the comparison of the ring's spectrum inside and outside the spoke would be very useful in understanding the nature and the formation processes of these vanishing ring's features.

References

[1] Nicholson, P. D., et al. (2008) *Icarus* **193**, 182-212.