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MINERALOGICAL MAPPING OF QUADRANGLE Av-2 (BELICIA) and Av-3 (CAPARRONIA) ON 4 VESTA.

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Since the arrival of the Dawn spacecraft at 4 Vesta on July 16, 2011 the Visible and InfraRed Imaging Spectrometer (VIR) has acquired hyperspectral images of Vesta's surface, which enable to characterize Vesta's mineralogical composition in the wavelength range from 0.25 to 5.1μm. As part of the analysis of Vesta's surface composition the science team is preparing a series of 15 quadrangle maps showing the results derived from the spectroscopic analysis of the VIR and FC color data. We present preliminary results of the spectroscopic analysis achieved for the quadrangles Av-2 (Belicia) and Av-3 (Caparronia), which show Vesta's surface between 21°N - 66° N°, 0° – 90°E and 90° - 180° E, respectively. These results are based on the analysis of the combination of the visible albedo, spectral parameters including the position, depth of the pyroxene absorptions, as well as color ratio composites using the VIR channels centering at 749nm/438nm (Red), 749nm/917nm (Green) and 438nm/749nm (Blue). Vesta's rotation axis, however, is tilted ∼29° with respect to its orbital plane. Since Dawn arrived during northern winter, portions of Vesta north of ∼45° N are dominated by extended shadows or have not yet been imaged due to permanent night. Thus, limited FC color or VIR hyperspectral data have been available for the quadrangles Av-2 and Av-3. The illuminated parts are dominated by a heavily-cratered northern terrain with ancient troughs and grooves and named after the prominent relatively large impact craters Belicia (∼37°N/48°E) and Caparronia (∼36°N/167°E). Numerous impact craters of different size, morphology, and state of surface degradation are apparent. Most spectral variations are strongly affected by the extreme illumination conditions, making the analysis of albedo variations and spectral signatures rather difficult. Their interpretation thus remains. Nevertheless, VIR spectra show clear evidence of Vesta's surface composition similar to those of HED (howardite, eucrite and diogenite) meteorites. The prominent pyroxene absorptions near 0.9 and 1.9μm show different band depths and band centers, which are associated with the presence and abundance of the mafic minerals as well as grain size. Within the quadrangles Av-2 and Av3, band centers appear to shift slightly to shorter wavelength from W to E following the trend of the equatorial region. A similar trend can be observed with respect to the depth of the pyroxene absorptions with the absorption deepening eastward. Locally, bright material associated with strong pyroxene absorptions is observed on crater walls of a few relatively large impact craters with pronounced topography. Either these impact craters are relatively young or fresh material became exposed due mass wasting processes. The effects of photometry for under these illumination conditions are being assessed.

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