

4 Vesta in Color: High Resolution Mapping from Dawn Framing Camera Images

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Rotational surface variations on asteroid 4 Vesta have been known from ground-based and HST observations, and they have been interpreted as evidence of compositional diversity. NASA's Dawn mission entered orbit around Vesta on July 16, 2011 for a yearlong global characterization. The framing cameras (FC) onboard the Dawn spacecraft will image the asteroid in one clear (broad) and seven narrow band filters covering the wavelength range between 0.4-1.0 μm . We present color mapping results from the Dawn FC observations of Vesta obtained during Survey orbit (~3000 km) and High-Altitude Mapping Orbit (HAMO) (~950 km). Our aim is to create global color maps of Vesta using multi spectral FC images to identify the spatial extent of compositional units and link them with other available data sets to extract the basic mineralogy. While the VIR spectrometer onboard Dawn has higher spectral resolution (864 channels) allowing precise mineralogical assessment of Vesta's surface, the FC has three times higher spatial resolution in any given orbital phase. In an effort to extract maximum information from FC data we have developed algorithms using laboratory spectra of pyroxenes and HED meteorites to derive parameters associated with the 1-micron absorption band wing. These parameters will help map the global distribution of compositionally related units on Vesta's surface. Interpretation of these units will involve the integration of FC and VIR data.