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Compositional Mapping of the Av-4 Domitia Quadrangle of Asteroid 4 Vesta

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The Dawn spacecraft is currently orbiting 4 Vesta, returning data about the geology, composition, shape, and internal structure of this differentiated asteroid. Here we present compositional interpretations for the Av-4 Domitia quadrangle, one of the 15 quadrangles currently being mapped in terms of both geology and mineralogy by the Dawn Team. The maps are based on data acquired by Dawn's Framing Camera (FC) and Visible and Infrared Mapping Spectrometer (VIR-MS). The FC images the surface through one broadband clear filter and seven narrow-band filters from 0.44 to 0.98 μm at pixel scales of $\sim$250 meters from Dawn's survey orbit and less than 20 meters from its low-altitude mapping orbit (LAMO). VIR-MS maps the surface in more than 850 spectral channels from 0.25 to 5.1 μm with pixel scales from 800 meters in the survey orbit to $\sim$50 meters from LAMO. The Av-4 Domitia quadrangle covers the region from 21-66° N and 180-270° E. It is currently winter in the northern hemisphere of Vesta, and only the southern $\sim$half of this quadrangle has been in sunlight since Dawn's arrival. The portion viewed thus far is part of Vesta's Northern Heavily Cratered Terrain that includes a NW-SE trending trough system, and exposures of dark material. The current illumination conditions (high incidence angles) are not ideal for interpreting spectral reflectance data, and much of the variation in band depth and center is thus far related to variations in incidence angle. However, some regional trends are evident. Absorption bands are generally similar to the global average; band centers are intermediate and appear to increase toward the east, consistent with a mixed-Eucritic composition.

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