ROTATIONAL PROPERTIES OF V-TYPE ASTEROID 2579 SPARTACUS. N. A. Moskovitz[1] and B. D. Warner[2], [1]Carnegie Institution of Washington, Department of Terrestrial Magnetism, 5241 Broad Branch Road, Washington, DC 20015, nmoskovitz@dtm.ciw.edu, [2]Palmer Divide Observatory, 17995 Bakers Farm Road, Colorado Springs, CO 80908, brian@MinorPlanetObserver.com.

V-type asteroids are believed to represent fragments of basaltic crust from differentiated planetesimals. In the inner Main Belt (a < 2.5 AU) the population of V-types is dominated by members of the Vesta collisional family, collectively referred to as the Vestoids. In fact, spectroscopic surveys of this region [1,2,3] have yet to identify a V-type asteroid *not* related to Vesta. This is problematic in light of oxygen isotope analyses of basaltic HED meteorites which suggest these meteorites derive from several distinct differentiated parent bodies [4]. Since the inner Main Belt is the probable source of these meteorites [5,6], basaltic material unrelated to Vesta should exist in this region.

Mineralogical analyses of NIR spectra have identified a single candidate that may be an example of a non-Vesta V-type in the inner Main Belt: asteroid 2579 Spartacus. Spartacus is approximately 5 km in diameter and orbits near the periphery of the Vesta family. Burbine et al. [1] found that the NIR spectrum of Spartacus indicates a composition more olivine-rich than that of typical Vestoids.

One model for Vestoid formation involves the reaccumulation of small (meter scale) fragments removed from Vesta's crust and upper mantle at the time of the family-forming collision [7]. In this scenario it is unclear how large amounts of Vesta's olivine-rich mantle preferentially re-accreted into a single body to form Spartacus, but did not for the other ~50 Vestoids that have been spectroscopically studied. It is possible that Spartacus is a monolithic unit removed intact [8]. If this is the case then it may sample a compositional gradient across Vesta's crust and upper mantle. Alternatively, Spartacus could be unrelated to Vesta.

We have conducted a photometric and spectroscopic campaign to better constrain the mineralogy of Spartacus and determine whether its surface displays any compositional heterogeneity. A photometric light curve for Spartacus was measured at the Palmer Divide Observatory (Fig. 1). Near-infrared (NIR) spectroscopic observations were conducted on February 1, 2012 at NASA's IRTF using the SpeX instrument [9]. A time series of spectra were obtained that cover nearly two full rotation periods (Fig. 2). Initial analysis of these data reveal spectroscopic variability (e.g. center of the 2 micron absorption band) that is periodic with rotation. We will present the results of this compositional analysis and a full treatment of rotational properties including constraints on the pole orientation of Spartacus.

References: [1] Burbine T. H. et al. (2001) *Meteoritics & Planet. Sci.,* 36, 761-781. [2] Moskovitz N. A. et al. (2010) *Icarus,* 208, 773-788. [3] Mayne R. G. et al. (2011) *Icarus,* 214, 147-160. [4] Scott E. R. D. et al. (2009) *Geochim. Cosmochim. Acta*, 73, 5835-5853. [5] Gladman B. J. et al. (1997) *Science*, 277, 197-201. [6] Bland P. A. et al. (2009) *Science*, 325, 1525-1527. [7] Eugster O. et al. (2006) in *Meteorites and the Early Solar System II*, pp. 829-851. [8] Asphaugh E. (1997) *Meteoritics & Planet. Sci.*, 32, 965-980. [9] Rayner J. T. et al. (2003) *PASP*, 115, 362-382.

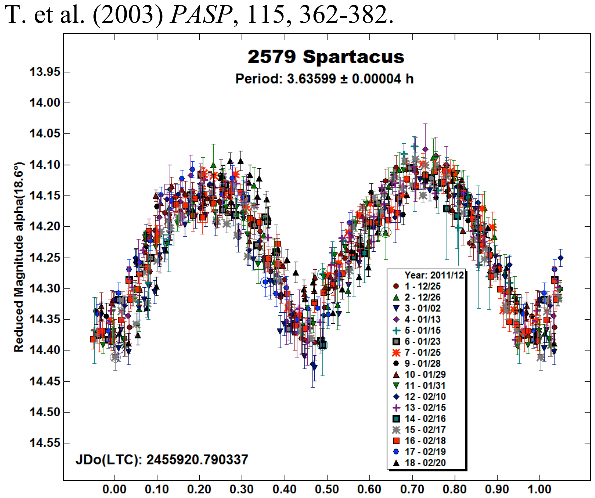

Figure 1: Rotational light curve of 2579 Spartacus showing a period of 3.63599 ± 0.00004 hours.

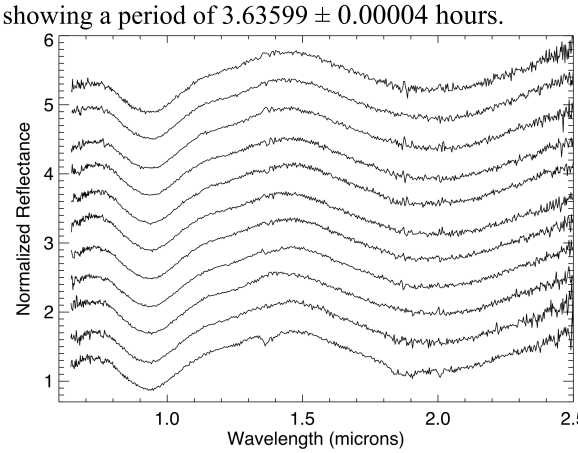

Figure 2: Spectra of 2579 Spartacus spanning over 6 hours of observations and spaced at ~30 min intervals. The spectra have been normalized at 1 μm and offset.