Ribbons on Vesta: Exploring a possible fluidized flow near Sossia crater

K. H. G. Hughson,[1] C. T. Russell,[1] D. L. Buczkowski,[2] A. Frigeri[3]

[1] *Department of Earth, Planetary, and Space Sciences, UCLA, Los Angeles, CA, USA*
[2] *Applied Physics Laboratory, Johns Hopkins University, Laurel, MD, USA.*
[3] *Istituto di Astrofisica e Planetologia Spaziali, Intituto Nazionale di Astrofisica, Rome, Italy.*

Contact: p151c@ucla.edu (Hughson)

Abstract. Geological mapping of the surface of Vesta by the examination of data collected by the Dawn spacecraft has resulted in several remarkable discoveries. One of these findings is that of an approximately 390km long quasi-continuous linear feature trending NW-SE on the Vestan surface. The feature, known colloquially as the 'dark ribbon' or simply the 'ribbon'[1,2], appears to start roughly 70km SE of the center of Minucia crater (219.0 °E, 10.0 °N), crosses Vestalia Terra, and terminates near Sossia crater (285.4 °E, -36.8 °N) (See figure 1; arrows 1 and 3 point to the ends of the ribbon, N represents Numisia crater). The ribbon is characterized in clear filter images by its low albedo, and in *Clementine* color ratio images by a striking blue false color[3]. It has been postulated that the ribbon may be a fluidized ejecta flow caused by entrained gases generated during the impact that formed Drusilla (D) crater[1,2]. In this study we examine the ribbon's southeast terminus near Sossia in detail using framing camera and spectroscopic images collected by the Dawn spacecraft. We attempt to put constraints on the ribbon's spatial extent, morphology, and composition in the vicinity of Sossia in order to better evaluate its origin in this area.
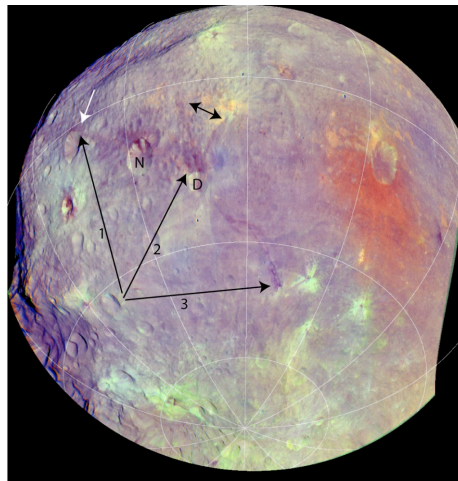
Fig. 1: From [2]. Enhanced color image of Vesta. Arrows 1 and 3 roughly bracket the dark ribbon. Arrow 3 points towards Sossia, which is the region of interest for this study.

[1] Buczkowski D. L. (2014) Icarus, doi: 10.1016/j.icarus.2014.03.035.
[2] Buczkowski D. L. et al. (2014) LPSC 45, Abs. #2165.
[3] Nathues A. et al. (2014) EPSC, Abs. #2014-251.