**GEOLOGICAL HISTORY OF SAMODIVA MONS REGION, DEVANA CHASMA QUADRANGE V-29, VENUS.** D. G. Malyshev[1], R. E. Ernst[2,3], H. El Bilali[2,3], C. H. G. Braga[2], E. G. Antropova[2]. [1]Physics Faculty, Tomsk State University, Tomsk, Russia: malyshev.danil13@gmail.com, [2]Faculty of Geology and Geography, Tomsk State University, Tomsk, Russia, [3]Department of Earth Sciences, Carleton University, Ottawa, Canada.

**Introduction:** Samodiva Mons (volcano; 13.6º N, 291.0º E) and surrounding area (Fig. 1) are located east of Beta Regio (major plume center) [1], at the southern end of Hyndla Regio, a flat-topped highland consisting mostly of tesserae [2,3]. The Samodiva area is within Quadrangle V-29, for which some 1:5 M scale mapping has been done [8]. In the present research we are mapping grabens and flows at 1:500,000 scale. In the catalogue of [9] Samodiva is classified as an unnamed Arachnoid (subclass of corona) that is listed as being 70 km in diameter. This measurement refers to the upper portion of the Samodiva edifice. Figure 2 indicates an overall width of the edifice of 150 km and a central summit caldera 25 km in diameter and up to 500 m deep.

**Graben System History:** From the mapping of graben systems, which can be interpreted to overlie dyke swarms [7], seven different trends of dykes were distinguished (Fig. 3). The most pervasive radial (yellow lines, **Radial_S)** and another small circumferential (white lines close to the centre, **Concentric_S**) originate from Samodiva Mons; the sources of the five other graben systems are not yet identified. There are two north-south trends to the west of Samodiva Mons (blue and green lines, **C1-C2**). The northwest-southeast trend (red lines, **C3**) probably originates from Zhivana corona further to the west. On the east side there are three north-south trends (blue, pink, pale pink lines, **C1, C4-C5**), **C4** most likely has an unnamed corona to the north-east as the source. The age relationships, based on cross-cutting relationships, are (oldest to youngest): **C3**, **C1**, **Radial_S**, **C2**, **Concentric_S.** The relative ages of **C4** and **C5** are not yet constrained.

**Eastern Sector Lava Flow History:** There are at least five lava flow units, all belonging to Samodiva Mons, which are distinguished by trends and radar backscatter (Fig. 4). The relative age relationships were derived from embayment and cross-cutting relationships. The oldest flow is **fNE_3** is embayed by **fNE_2** and then by **fNE_1**. These flows are interpreted to be younger than the radiating dyke swarm (yellow lines, **Radial_S**) since the flows cover the dykes. To the east-northeast, due to local topography, flows (**fNE_2, fNE_4-5**) start to curve in a northern direction. **fNE_4** seems to be older; in the east-northeast it is covered by **fNE_2** and **fNE_5** crosscuts it. Although **fNE_4** and **fNE_5** each have radar dark backscatter, from the cross-cutting relationships they are of different ages. On the east side, two lava flows are recognized; **fE_2** is older than **fE_1** since the latter is cutting the first. The relationship of these two to the other three flows has not yet determined.

**Discussion:** At this stage of mapping it can be concluded that: 1) Grabens (interpreted to overlie dyke swarms) can be grouped into at least seven sets on the basis of trends and cross-cutting relationships; 2) On the east side there are several distinct lava flows originating from Samodiva Mons, and these are interpreted to be younger than the yellow radiating graben system (dyke swarm).

**Acknowledgments:** Magellan SAR images obtained from https://astrogeology.usgs.gov/search/?pmi-target=venus based on the data from https://pdsimaging.jpl.nasa.gov/volumes/magellan.html#mgnFMAP.

**References:** [1] Basilevsky A. and Head J. W. (2008) *Icarus,* 192, 167–186. [2] Basilevsky A. (2008). *USGS SIM* 3023. [3] Ivanov M. A., Head J. W. (2011). *Planet. Space Sci., 59, 1559–1600.* [4] Tandberg E. R. and Bleamaster L. F. (2010) *LPS XLI*, Abstract #1816. [5] Crumpler L. S. & Aubele J. C. (2000) *In Sigurdsson, H. (ed.), Encyclopedia of Volcanoes. Academic Press*, 727–769. [6] Buchan K. L. and Ernst R. E. (2021). *Gond. Res., 100, 25-43.* [7] Christensen P. R. et al. (2009). *AGU Fall Meeting.* Abstract #IN22A-06.

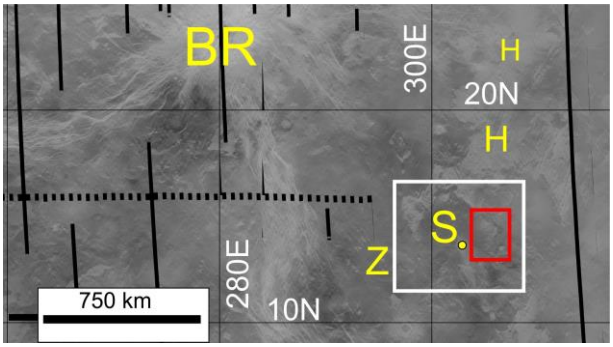


**Figure 1 –** Samodiva Mons (S) region, the focus of this mapping. Yellow dot marks centre of S. BR is Beta Regio. Z is Zhivana corona. The tesserae in the northern part of the image is the southern portion of Hyndla regio (H). White box is for Fig. 3, red box is for Fig. 4. Image from JMARS [10].

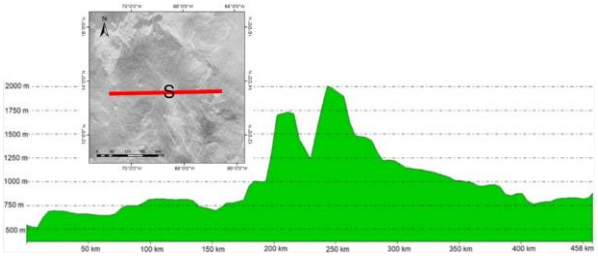


**Figure 2 –** E-W section across the central edifice of Samodiva which has an elevation of 1,250 m, a width of about 150 km and a summit caldera about 25 km wide and about 500 m deep. Inset shows location of E-W profile; S = center of Samodiva Mons.

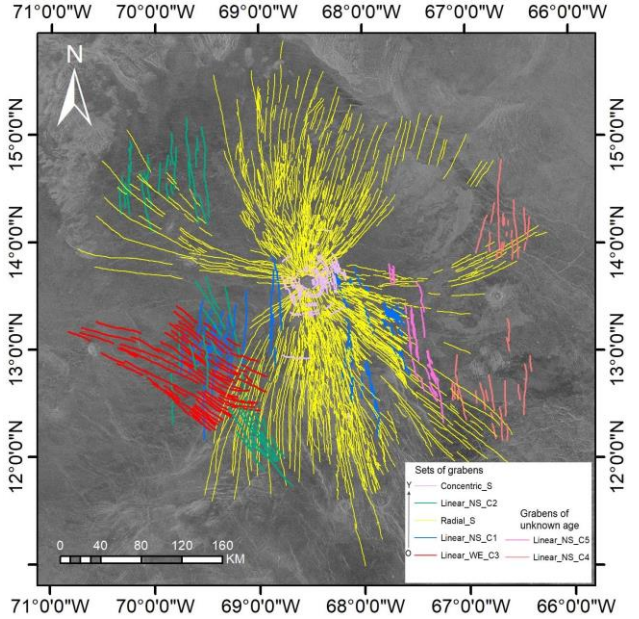


**Figure 3 –** Geological map of graben-fissure systems (interpreted to overlie dyke swarms). Colors represent different dyke swarms.

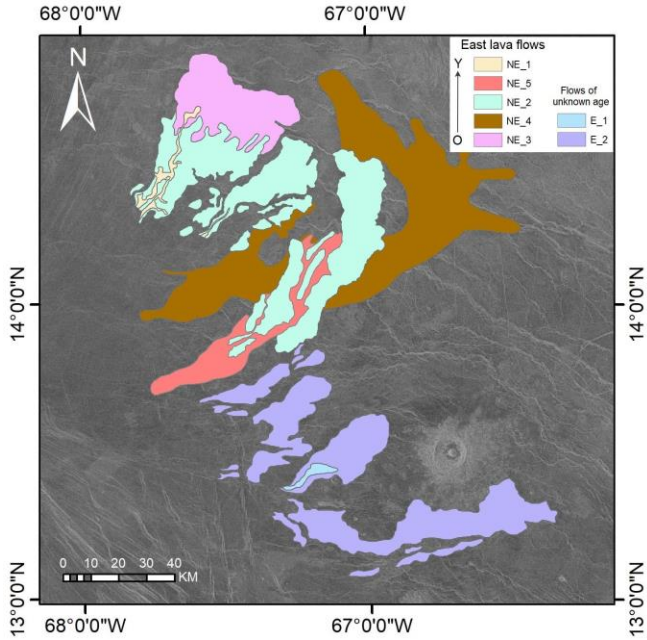


**Figure 4 –** Geological map of the area to the east of Samodiva Mons. Colors represent different generations of lava flows.