

GEOLOGICAL HISTORY OF ATAI MONS REGION, 2,000 KM SE OF PHOEBE REGIO, VENUS.

Budko¹, R.E. Ernst^{1,2}, H. El Bilali^{1,2}, ¹Faculty of Geology and Geography, Tomsk State University, Tomsk, Russia, sayanaro90@mail.ru, ²Department of Earth Sciences, Carleton University, Ottawa, Ontario, Canada; Richad.Ernst@ErnstGeosciences.com, hafidaelbilali@cunet.carleton.ca

Introduction: Detailed mapping (1:500,000 scale) is being done in the area SE of Phoebe Regio. This area is on the border between Phoebe Regio Quadrangle (V-41) which has not been previously mapped (Fig. 1), and Themis Regio Quadrangle V-53 to the south (25 S to 50 S), which has been mapped at 1:5,000,000 scale. [1] As shown in Figure 2 and 3 there are intense distributions of grabens in the region and they can be grouped into sets based on trend and geometry. As shown Figure 3 there are circumferential, radiating and linear sets. Notably, the main magmatic centre (Atai Mons, labelled 1) has both a radiating swarm (green) and circumferential swarm (light green). Additional centres to the north (labelled 2 and 3) also have associated circumferential swarms. There are numerous linear systems, notably the NNW trending pink that may belong to a regional swarm and belong to a centre outside the study area.

Many of these radiating and circumferential graben systems likely overlie dyke swarms [2,3], and therefore, are important igneous component of their magmatic centres. In addition, those major linear swarms that are also overlying dykes (and not purely rift related) would represent major dyke swarms belonging to more distal magmatic centres, potentially up to more than 1000 km away [2,3].

Future Work: Building on the preliminary mapping of the graben systems (dyke swarms) associated with Atai Mons and other centres in the region (Figs. 2 and 3). Detailed mapping of grabens and their link to magmatic centres will continue eastward across the map area in Figure 1, extending to Iweridd Corona and covering the intervening Dzerassa Planitia. The next task will be determining the age relationships of the magmatic centres through evaluating the cross-cutting relationships of their graben systems.

Another important component of this research will be detailed (1:500,000 scale) mapping of the flows and integration of the flow relationships with the framework built from the graben relationships.

The result will be a detailed and integrated understanding of the magmatic and tectonic history of this region SE of Phoebe Regio.

References: [1] [Stofan E.R. and Brian A.W. (2012) USGS SIM 3165. [2] Grosfils E.B., and Head

J.W. (1994) GRL, 21, 701–704. [3] Buchan K.L. and Ernst R.E. (2021) Gond. Res., 100, 25-43. [4] Christensen P. R. et al. (2009) AGU Fall Meeting, Abstract #IN22A-06.

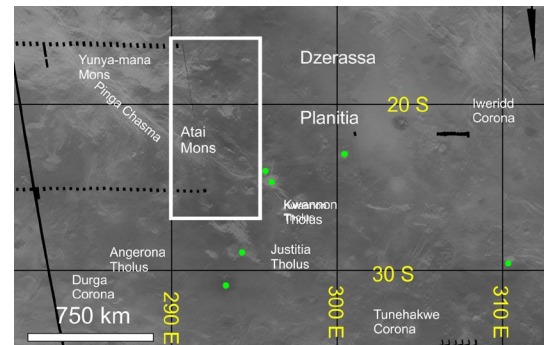


Figure 1. Region of area of study. Phoebe Regio is located to the NW. Background image is Magellan SAR image from JMARS [4].

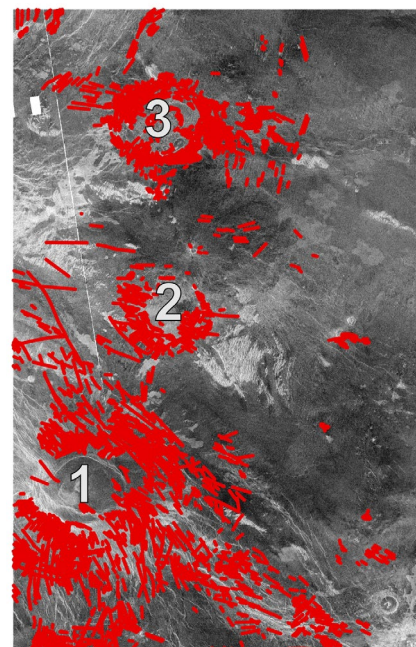


Figure 2. Distribution of mapped extensional lineaments. 3000 mapped so far.

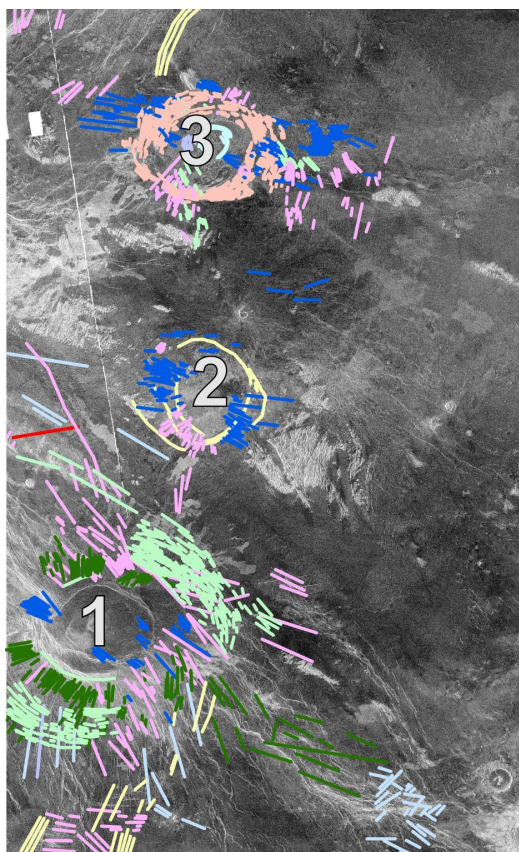


Figure 3. Generalized lines and grouped by colour into discrete swarm. See text for discussion of details. Numbers mark magmatic centres discussed in the text.