DETAILED MAPPING OF GRABENS IN A CORONA-RICH PORTION OF DALI CHASMA, 1000 KM SW OF ATLA REGIO, VENUS. A. Hasanaine[1], H. El Bilali[2,3], R.E. Ernst[2,3], N. Youbi[1] [1]Department of Geology, Faculty of Sciences-Semlalia, Cadi Ayyad University, Marrakesh, Morocco; rziki.23kech@gmail.com, [2]Department of Earth Sciences, Carleton University, Ottawa, Ontario, Canada; hafidaelbilali@cunet.carleton.ca; richard.ernst@ernstgeosciences.com, [3]Faculty of Geology and Geography, Tomsk State University, Tomsk, Russia;

Introduction: Although, corona can be abundant along chasma (rifts) (e.g. [1-6]), the role of corona in the evolution of chasma is not well understood. The present contribution is a detailed (1:500,000 scale) geological mapping of a section of this about 1000 km to the SW of Atla Regio (Fig. 1). The mapping will graben systems (interpreted to overlie dykes), normal faults associated with rifting, and associated flows, all integrated with topographic data. Herein we report on progress in mapping graben systems.

The goal of this high resolution (1:500,000 scale mapping) is an improved understanding of the relationships between corona and rift segments, and in particular to test the model of [6]. Based on detailed mapping of graben fissure systems and interpreted rift faults along a 1500 km long segment of Parga Chasma, [6] recognized that many coronae represent the locus of local triple junction rift centres, and extrapolated this observation to the entire length of both Parga and Hecate Chasmata.

Mapping Results: We have mapped 12,800 extensional lineaments (Fig. 2) and these have been generalized and grouped into multiple systems based on trend and geometry (radiating, circumferential and linear) (Fig. 3).

For instance, in the lower left of the image, there is centre 1 (Flidais Corona) which has both a yellow arcuate swarm (part of a circumferential swarm) and a radiating swarm (orangish yellow). Centre 2 also has both radiating (orangish yellow) and circumferential (green) swarms. Centre 3 has partial radiating (yellow to the north) and partial circumferential (pink on the north side) swarms. Centres 4-7 each have circumferential swarms. Centre 8 has a radiating swarm. In addition, there are major linear swarms, notably the NE trending red set (labelled A).

Many of these radiating and circumferential graben systems likely overlie dyke swarms [7,8], 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 [7,8]

Future Work: After further work on generalizing the graben systems and linking them to magmatic centres, the next step will be assessing the age relationships of the centres, through 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 corona-rich portion of Dali Chasma.

References: [1] Hamilton, V.E., Stofan, E.R. (1996) Icarus, 121, 171–194. [2] Martin, P., Stofan, E.R. (2004). 35th LPSC, Abstract # 1576. [3] Martin, P., et al. (2007). JGR, 112, E04S03. [4] Smrekar, S.E., et al. (2010). 115, E07010. [5] Ivanov, M.A., Head, J.W. (2015). Planet. Space Sci., 113-114, 10-32. [6] Graff, J.R., et al. (2018). Icarus, 306, 122-138. [7] Grosfils E.B., and Head J.W. (1994) GRL, 21, 701–704. [8] Buchan K.L. and Ernst R.E. (2021) Gond. Res., 100, 25-43. [9] Christensen P. R. et al. (2009) AGU Fall Meeting, Abstract #IN22A-06.

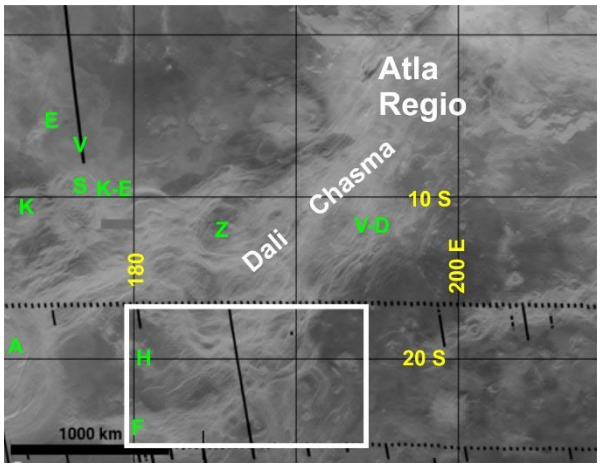

Figure 1. *Location of study area. Named Coronae: A = Atahensik, F = Flidais, K = Khabuchi, N = Nirmali, S = Sith, Z = Zemina. H = Henwen Fluctus, V-D = Vibert-Douglas Patera, V = Vilakh Tholus, K-E = Khotal-Ekva Tholi. Background Magellan SAR image from JMARS [9].*

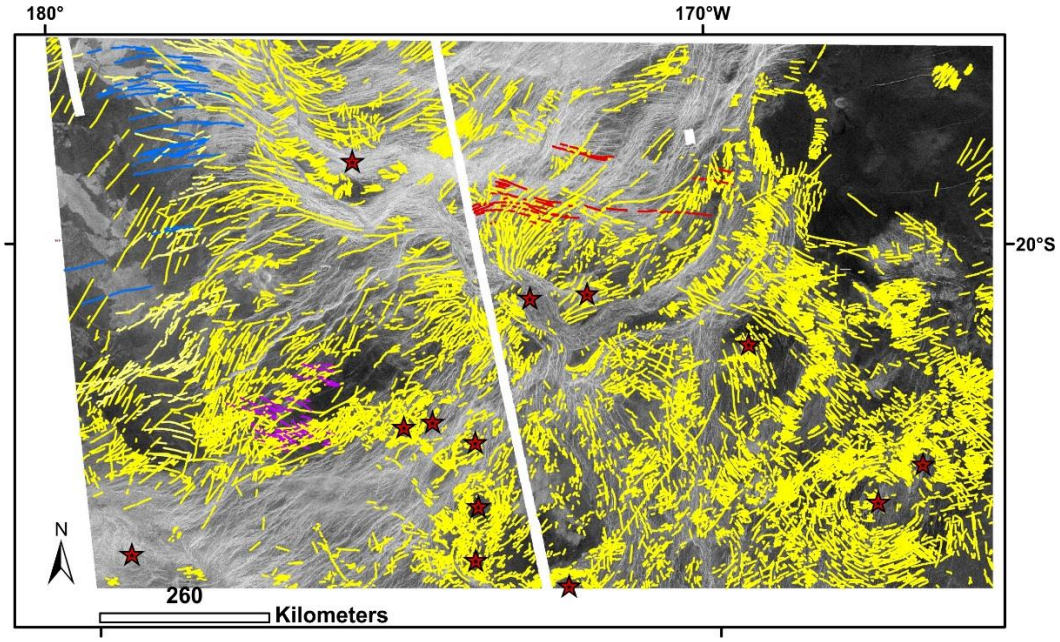

Figure 2. *Detailed mapping of grabens (12,800 lineaments mapped). Stars locate inferred magmatic centres, many associated with circumferential grabens and therefore likely corona.*

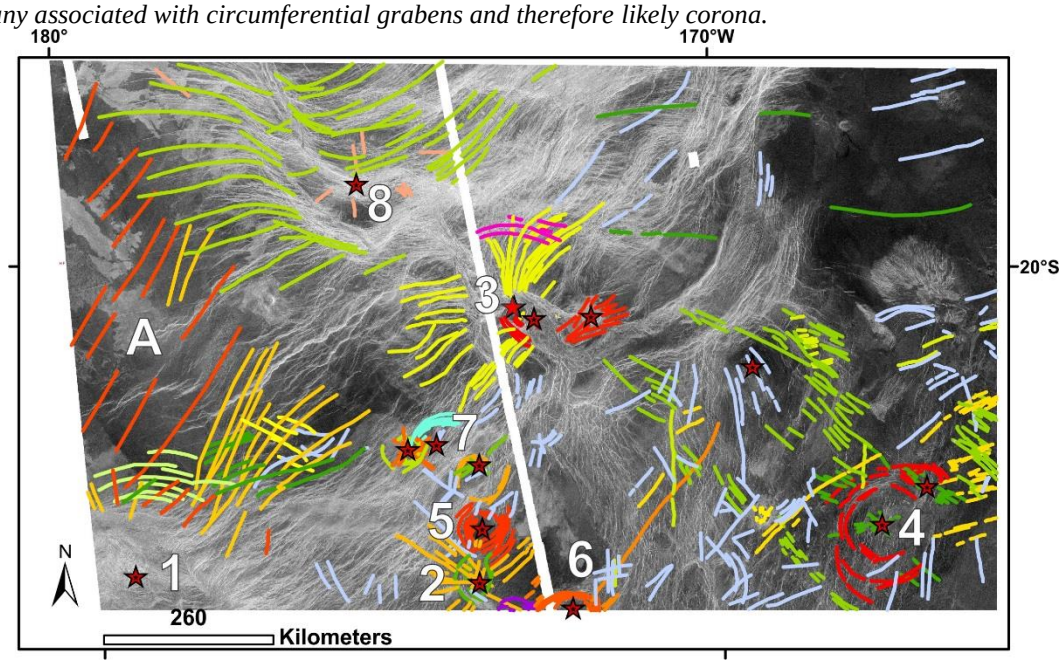

Figure 3. *Generalized distribution of grabens grouped into distinct sets distinguished by colour. Labels are linked to the discussion in the text.*