ONENHSTE AND ADJACENT CORONAE IN PARGA CHASMA, SE OF ATLA REGIO: DETAILED MAPPING AND GEOLOGICAL HISTORY. M. Ben Marzoug[1], H. El Bilali[2,3] R.E. Ernst[2,3], J.W. Head[4], N. Youbi[1], [1] Department of Geology, Faculty of Sciences-Semlalia, Cadi Ayyad University, Marrakesh, Morocco, marzoug375@gmail.com, [2]Department of Earth Sciences, Carleton University, Ottawa, Ontario, Canada; [3]Faculty of Geology and Geography, Tomsk State University, Tomsk, Russia,
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Introduction: The relationship between coronae and chasmata in space, time, and origin is a major outstanding question and has been extensively discussed (e.g. [1-6]). One such key region is along the 10,000 km long Parga Chasmata, which connects Atla Regio with Themis Regio. Based on detailed mapping of graben fissure systems and interpreted rift faults along a 1500 km long segment of Parga Chasmata [6], it was recognized that many coronae represent the locus of individual triple junction rift centres; this observed relationship was extrapolated to the entire length of Parga Chasmata (and also Hecate Chasmata) and a map of local centres of triple junction rifting focussed on coronae was produced, with further comparisons to the Atlantic rift system of Earth [6].

The goal of the current study is to provide detailed mapping (1:500,000 scale) of the graben-fissure systems, lava flows and rift faults, integrated with topographic changes in order to provide insights into the setting of these coronae within the rift zone, and their relationships and history. Our mapping builds on previous reconnaissance-scale mapping (1:5,000,000 scale) of Taussig Quadrangle (V–39) [7].

Onenhste Corona: We have selected a region along Parga Chasmata for detailed study. This area is about 2800 km SE from the centre of Atla Regio (Fig. 1) and for this specific area the grouping of rift segments and coronae into local triple junction centres [6] is shown in Fig. 2. The focus of the current research reported here is Onenhste Corona and adjacent coronae (Fig. 3-6).

Results of Mapping: Initial mapping of the graben-fissures is shown in Fig. 3: these graben-fissures are provisionally grouped into distinct sets in Figures 4 and 5. Notably there is an impressive radiating swarm centred on Onenhste which can be divided into three subswarms each focused on a slightly separate centre (Fig. 4). Furthermore, the three centres also correspond to centres on the basis of circumferential systems (Fig. 5).

We interpret these radial structures to represent radial dyke swarms, and not structural uplift and radial tectonic fracturing, on the basis of the following types of evidence: 1) lava flows often emanate from the radiating graben, 2) there is a. lack of distinctively elevated central topography that might have caused uplift and radial fracturing, 3) radial features extend significantly beyond any central topographic variation [8], and 5) the systems are dominantly radial to the central structure, rather than being influenced by the tectonic deformation of the regional rift zone.

Ongoing mapping efforts are focused on these relationships, assessing their role in the geologic history of the region, and establishing the relationship between these types of features and their associated rift zones in the global geological evolution of Venus [5].

References: [1] Hamilton, V.E., Stofan, E.R. (1996) Icarus, 121, 171–194. [2] Martin, P., Stofan, E.R. (2004) 35th LPSC, Abstract no. 1576. [3] Martin, P., et al. (2007). JGR, 112, E04S03. [4] Smrekar, S.E., et al. (2010). JGR, 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] Brian, A.W., et al. (2005). USGS SIM 2813. [8] Grosfils, E.B. Head, J.W. (1994) GRL, 21: 701–704.

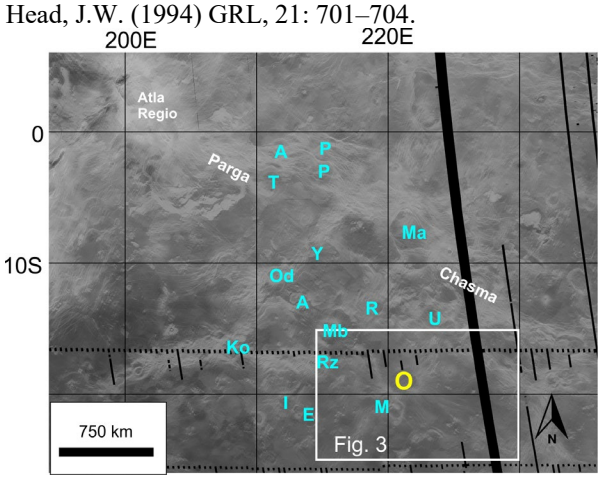

Figure 1: *Location map of study area. Onenhste Corona as part of a regional cluster of large coronae associated with Parga Chasma. Named coronae (in black letters) are: A = Attabeira, C = Chantico, E = Emegelji, I = Inacho, K = Kolias, Ma = Maram, M= Momu,* ***O = Onenhste****, Od= Oduduwa, P= Pazar-ana, R = Repa, Rz = Rzhanitsa, T = Tadaka, and Y = Ya-Yerv. Box shows location of Figure 3.*

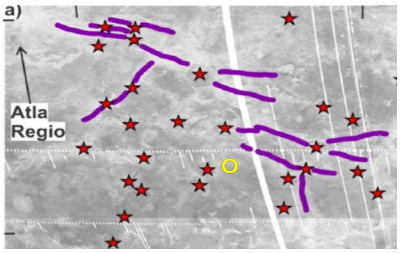

Figure 2: *Location of rift segments along NW end of Parga Chasmata from [6]. Stars locate corona. O = Onenhste corona.*

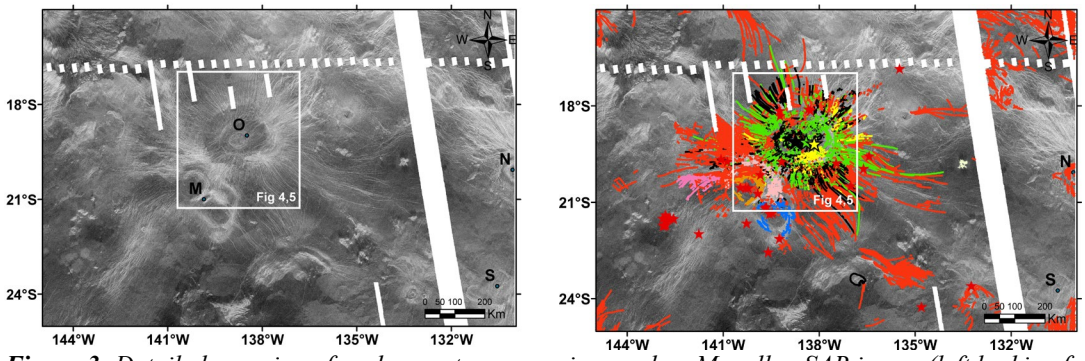

Figure 3*: Detailed mapping of graben systems superimposed on Magellan SAR image (left looking from Cycle 1). About 9400 lineaments mapped so far.*

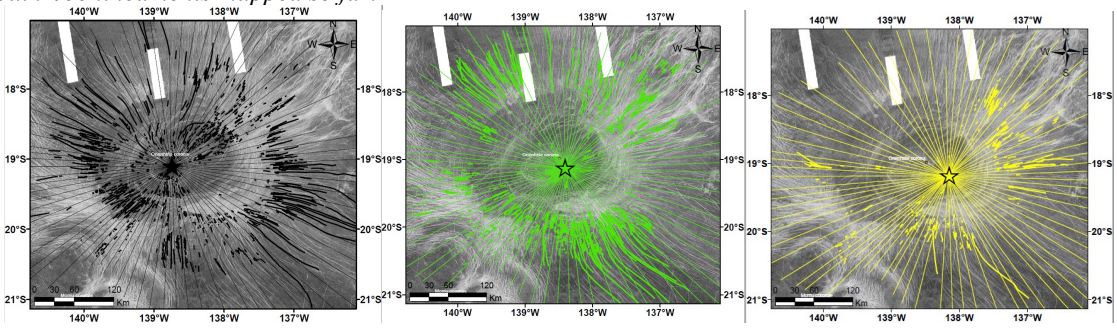

Figure 4*: Detailed mapping has revealed that the overall radiating swarm occurred in at least three generations associated with different magmatic centres (shown by stars). These three centres are also consistent with the radiating swarms associated with the circumferential patterns shown in Figure 5.*

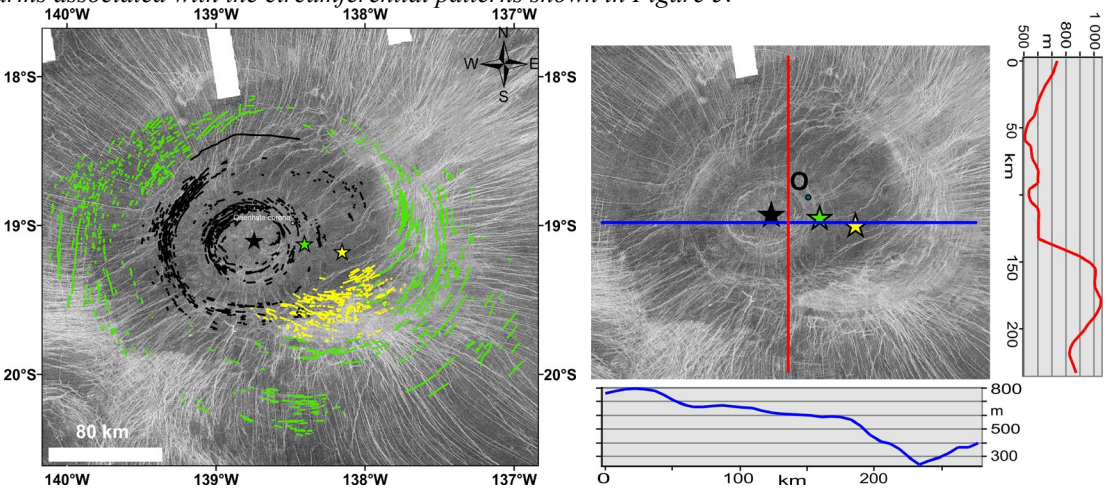

Figure 5*: Circumferential swarms. The three colours (black, green and yellow) are linked to the three magmatic centres shown in Figure 3.*