JOKWA LINEA GROOVE BELT, SE STANTON QUADRANGLE (V-38), VENUS: GEOLOGICAL HISTORY FROM DETAILED MAPPING. R. Oukhro[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; [2]Department of Earth Sciences, Carleton University, Ottawa, Ontario, Canada; [3]Faculty of Geology and Geography, Tomsk State University, Tomsk, Russia; [4] Department of Earth, Environmental and Planetary Sciences, Brown University, Providence, Rhode Island, USA.

Introduction: Lineae are elongated features that are associated with abundant additional parallel lineaments that occur together in narrow elongated topographic highs. Lineae have also been termed fracture belts, densely lineated material, and more recently, groove belts (see summary of nomenclature in [1,2]). Excellent examples of groove belts (Antiope, Hippolyta, and Molpadia Lineae) are described from Lavinia Planitia (e.g. [3,4]). Key outstanding questions about groove belts include the nature of the lineae (fractures, graben?), their origin (tectonic, surface manifestation of dykes?), the origin of their associated linear elevated topography (extension, compression, shear?), their relationship to surrounding regional and global geologic units (prior to, simultaneous, post-dating?) the nature of the material being deformed (similar to or different than surrounding units?), and establishing their relationship to other associated features (coronae, novae, rift zones, shield volcanoes, etc.).

Key questions for our ongoing mapping include 1) distinguishing the radial and belt parallel grabens in more detail, 2) assessing their dyke-related versus purely tectonic origin (e.g., presence of pit craters, feeding of flows, etc.), 3) examining stratigraphic and morphological relationships with the more regional components of the groove belts (mapped in green and blue in Fig. 2), and 4) assessing the relationship of these central features to coronae, novae and related features located in adjacent areas to the groove belt (cf. in Wawalag Planitia to the south [10]).

Location and Geological Setting: Jokwa linea (Fig. 1) extends for 1700 km from within southeastern Stanton Quadrangle, V-38 and eastward into the adjacent Taussig Quadrangle, V-39, where it has been mapped at 1:5,000,000 scale [5]. However, no Quadrangle scale mapping exists for V-38.

Mapping Methodology: For our geological mapping study of Jokwa Linea, we used full-resolution (75 m/pixel) Magellan SAR images and its altimetry data in ArcGIS ArcMap v. 10.3; JMARS (Java Mission-planning and Analysis for Remote Sensing) [6] and ArcGIS 10.3 ArcScene were used to create topographic profiles and digital elevation models (DEMs), respectively. Geological units are distinguished based on changes in radar properties, topography, morphology and stratigraphic relationships (e.g., [1]).

Geological History: Our initial mapping reported here is from a 620 km long section of the western half of Jokwa Linea (Fig.1). Multiple sets of lineaments have been mapped (so far more than 17,000) and are shown in different colors and numbers (Fig. 2). Our mapping includes identifying, distinguishing rift-faulting from graben-related dykes using criteria in [7], and assessing their relationships and timing. Our mapping has also identified and characterized 9 magmatic centres in western Jokwa linea (comprising corona and nova and corona-nova [8, 9]).

In the eastern portion of the map, circumferential grabens (interpreted to overlie subsurface dykes) are associated with coronae. There are multiple radiating graben sets (each interpreted to represent the surface expression of dykes on the basis of associated lava flows and pit craters) in the west, some extending for more than 400 kilometers. Major parts of these radiating graben systems (dyke swarms) curve into the strike of the broader groove belt and match its regional trend, which we interpret to indicate the role of regional stresses in dyke propagation direction.

Age relationships between swarms and associated magmatic centres (from cross cutting relationships), and flows fed from graben are illustrated in Figure 3.

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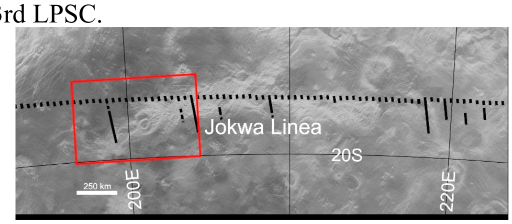

Fig. 1: *Location of our map area in the western portion of Jokwa linea.*

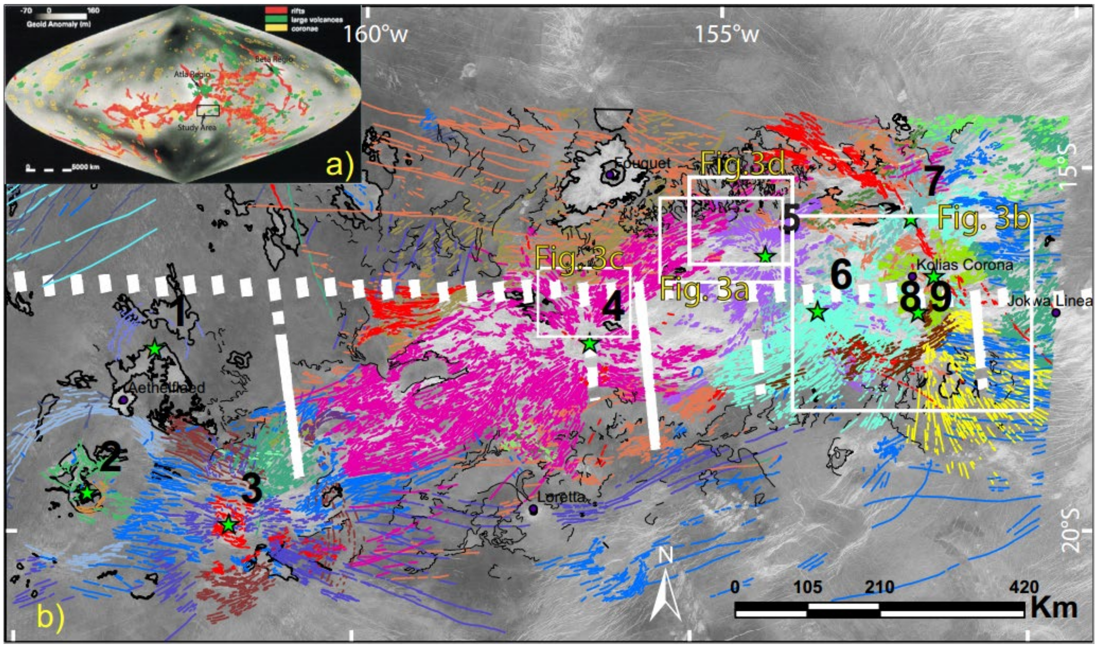

Fig. 2: Mapped lineaments of Jokwa linea (b). Inset (a) shows location of map area on global map of Herrick (1999).

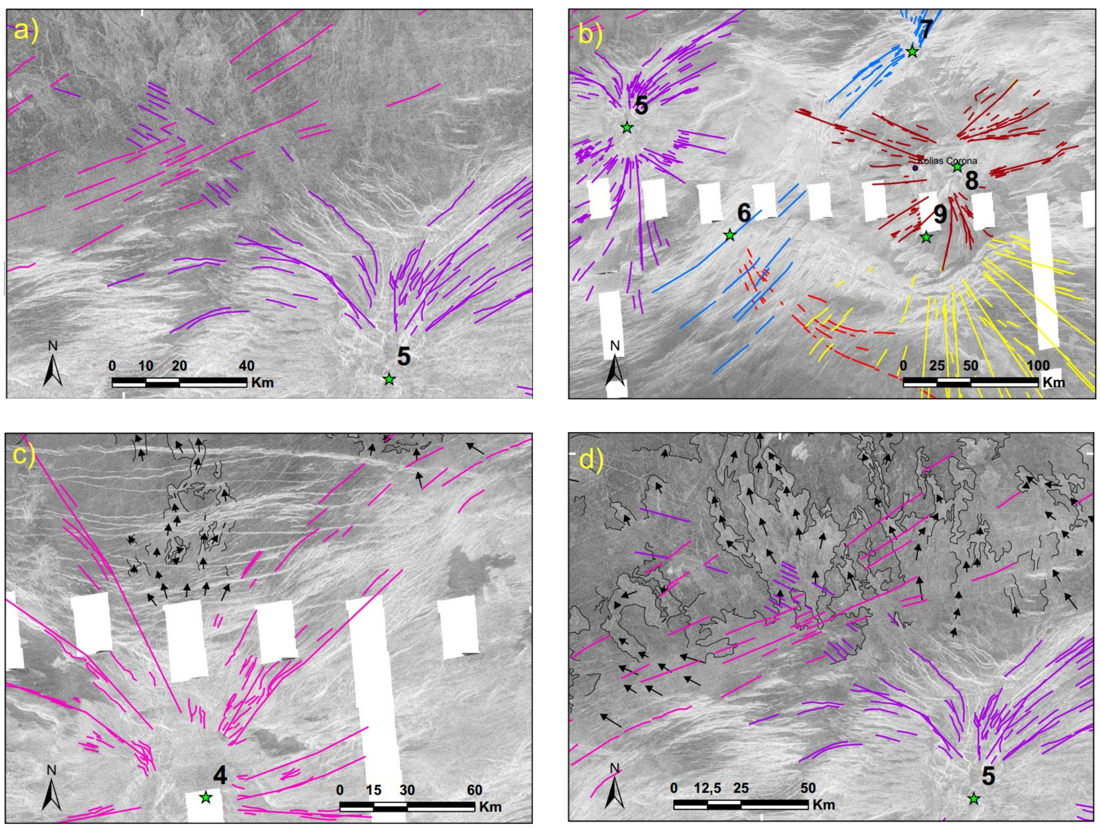

Fig. 3: *Diagrams illustrating relationships between the different graben systems and flows, superimposed on Magellan SAR left looking images from Cycle 1.* ***a)*** *Pink radiating swarm of centre 4 is younger than the purple radiating swarm of centre 5. b) Blue radiating swarm from magmatic centre 7 is younger than the red radiating swarm of centre 6. Yellow radiating swarm of centre 9 is older than the brown radiating swarm of centre 8. c) Lava flows from magmatic center 4. d) Lava flows from dyke swarm of magmatic center 4.*