GEOLOGIC MAPPING OF THE OVDA REGIO QUADRANGLE (V35), VENUS: PRELIMINARY RESULTS. L. F. Bleamaster III and V. L. Hansen, Department of Geological Sciences, Southern Methodist University, Dallas, TX 75275 (lbleamas@mail.smu.edu).

Introduction: The Ovda Regio Quadrangle, Venus (V35) is host to portions of two crustal plateaus consisting of tessera terrain (eastern Ovda and western Thetis), Inari (and other) coronae, numerous small volcanic edifices, impact craters, large flows, and Kuanja chasma (fracture zone) (Fig. 1). With the exception of plains material (nearly non-existent), Ovda Regio represents most of the geologic and structural features observed on Venus. Preliminary mapping (nearly 75% complete) provides the basis to propose an inaugural geologic history for the region.

Tessera: Tessera terrain within the V35 quadrangle is found to be the oldest deformed crust and is located mostly within two crustal plateaus, eastern Ovda and western Thetis. A few small outlying patches of tessera exist and locally these patches represent the oldest terrain as well. Structural patterns within the tesserae of eastern Ovda and western Thetis suggest that the two crustal plateaus record distinctly different deformational periods [1,2], however all tessera has been mapped as an equivalent unit for the time being. This is not to suggest that all the tessera in V35 formed at the same time, but that tessera represents the locally oldest deformed material and there is no robust way to determine relative ages between eastern Ovda and western Thetis at this time. Further mapping will address this problem

Coronae: Inari Corona, located in the far southeast corner, is the largest corona within the V35 Quadrangle and is responsible for large outpourings of lava. Inari Corona is in close proximity to a chasmata complex (Kuanja Chasma) to the north and has a well-defined double annulus on its southwest flank with a flooded moat between the inner and outer annuli. Inari Corona's southern flank is most similar to coronae type 6 described by Stofan et al. [3], with a low interior and double raised ring. The northeast flank does not exhibit this character, suggesting that the double ring did not develop in the north or pervasive fracturing associated with the chasmata complex has overprinted it.

Numerous other small coronae are present in the southwest corner of V35. Flows from these coronae are not as extensive as the flows from Inari Corona, however the small coronae cluster does represent the source region for most of the material observed in the southwest corner. Timing relations between the small coronae are difficult to discern due to the overlapping of numerous small coronal flows and other point source flows in the vicinity.

Kuanja Chasma (fracture zone): Kuanja Chasma represents a very large (>2500 km long, ~4 km deep) topographic depression characterized by an undulating,

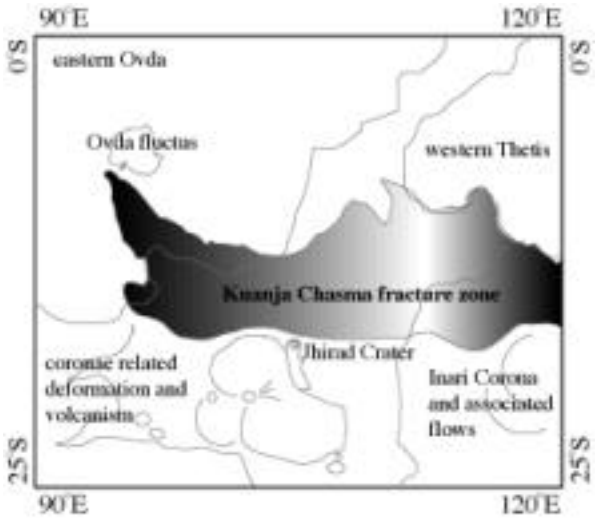

Fig. 1. A schematic map of the Ovda Regio quadrangle (V35) with locations of prominent features.

anastomosing swarm of fractures and pit chains. Although Kuanja Chasma is defined by its topographic expression, the Kuanja fracture zone is a broader feature that is extended to the north and south by mapping the structural suite associated with the chasma. The structural suite is composed of narrow fractures, 10's to 100's of kilometers in length, and pit chains of similar dimensions. No major flows are assigned to the chasmata complex.

Geologic History: Geologic mapping indicates that tessera terrain, whether as part of a crustal plateau or as an isolated patch, represents the locally oldest deformed crust. It is unclear at this time if a preexisting base flow is preserved. Within the tessera of eastern Ovda there is a radial pattern of shear-fracture ribbons [4] that represents early extension. Eastern Ovda's tessera is also host to a set of semi-concentric marginal folds that are cut by late-stage complex graben [1]. Graben in this area appear to utilize weaknesses in the crust imposed by the earlier formed ribbon structures. Similar patterns, although not as well defined, exist in western Thetis. The two, distinct, coherent sets of structures strongly suggest that the tesserae of Ovda and the tesserae of Thetis do not represent the same deformational event.

After formation of the tessera structures, volcanism is seen in the form of Intra-Tessera Basin (ITB) [5] lava fill. ITB lavas indiscriminately fill both small and large-scale structural depressions in Ovda and Thetis. Banks et al. and Hansen et al. have studied other ITBs and have shown that volcanism is an important process throughout the construction period of crustal plateaus [2,5]. More detailed study of Ovda and

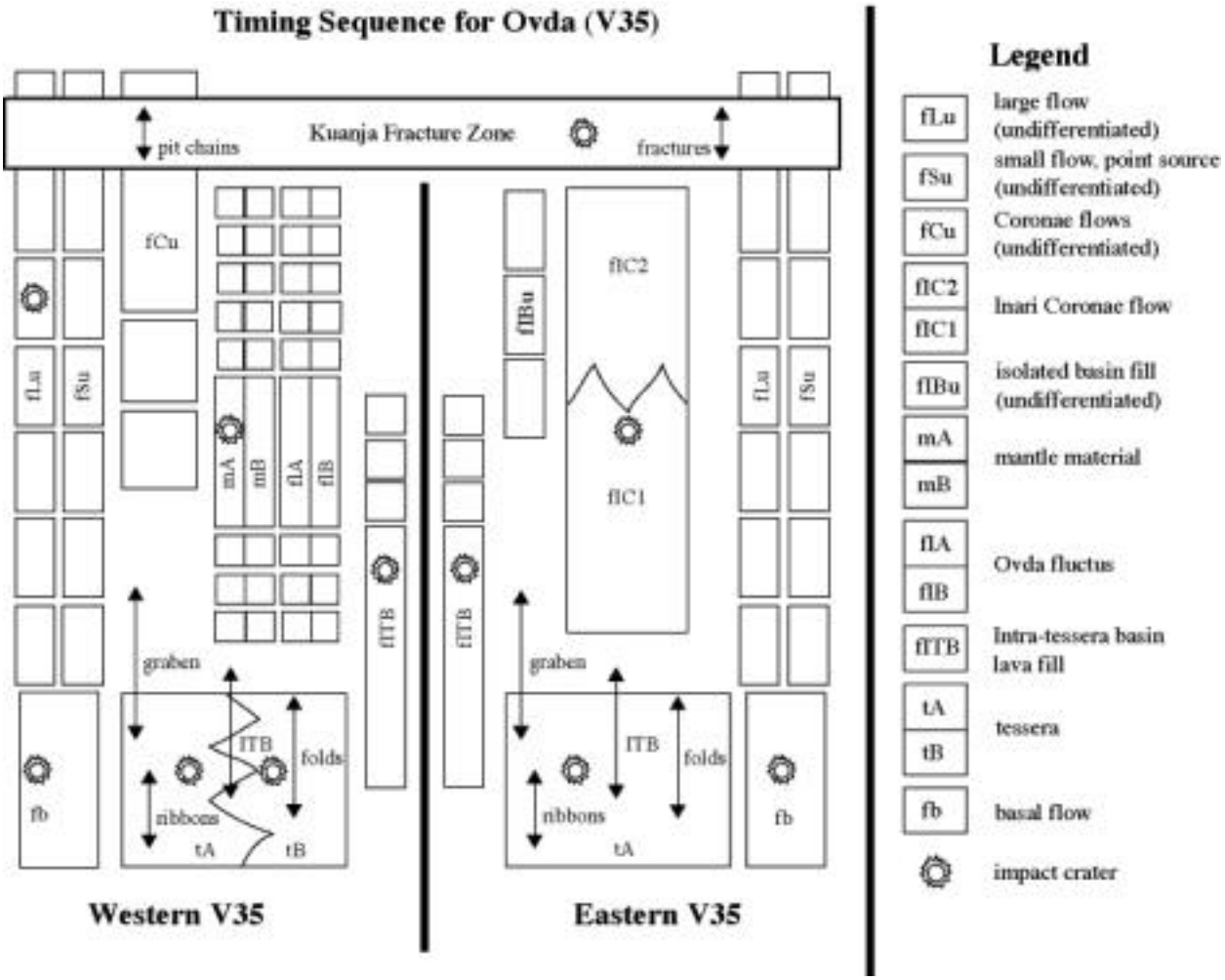

Fig. 2. Regional-scale, map-unit, correlation chart for V35. The heavy bold line in the center of the chart represents a break in the continuity of units from the western to the eastern regions of V35. Note that only the fracture zone can be traced across the dividing line.

Thetis ITBs is required to make a robust comparison to the ITBs of other authors.

As depicted on the correlation chart (Fig. 2), events transpire differently in the western and eastern regions of V35. Inari coronae and its flows (initial, laterally extensive flows followed by smaller flows emanating from summit fractures similar to those of Senske [6]) dominate the activity in the east whereas the emplacement of Ovda fluctus and a mantling material is observed in the west. There is no way to determine the relative timing relations between these two isolated occurrences except that they are both older than the pervasive fracturing of the Kuanja Chasmata complex. Structures from the Kuanja fracture zone cut all material units with the exception of some localized small flows and coronal flows in the southwest.

Impact craters are recognized to be punctuated events in time and have been placed in the appropriate material they deform.

References: [1] Ghent, R. R. and Hansen, V. L. (1999) *Icarus, 139*, 116-136. [2] Hansen, V. L., Banks, B. K., and Ghent, R. R. (1999) *Geology, 27*, 1071-1074. [3] Stofan, E. R. et al. (1997) in *Venus II*, U. Arizona Press, Tucson, 931-965. [4] Hansen, V. L. and Willis, J. J. (1996) *Icarus, 123*, 296-312. [5] Banks, B. K. and Hansen, V. L. (1999) *LPSC XXX*, #2053. [6] Senske, D. A. (1999) *LPSC XXX*, #1671.