COMPARISON OF MAPPING TESSERA TERRAIN IN THE PHOEBE REGIO (V-41) AND TELLUS TESSERA (V-10) QUADRANGLES. D. A. Senske, Jet Propulsion Laboratory/California Institute of Technology, Pasadena, CA 91109.

Introduction: Tessera terrain was first described from data collected by the Venera 15/16 spacecraft [1]. These high standing crustal plateaus are characterized by enhanced radar-scale roughness (*i.e.* at the 12-cm Magellan radar wavelength), low radar reflectivity and multiple episodes of deformation. Outcrops range from local exposures (100s of km across) to continent sized (*e.g.* Aphrodite Terra). To understand the tectonic history of these relatively old terrains, detailed geologic and stratigraphic relations have been assessed by a number of investigators [2,3,4]. Tessera is typically mapped as a global-scale unit although significant variations in both geologic setting and character are observed. This leads to the suggestion that the rock material making up these terrains may vary across the planet. As such, we are carrying out geologic mapping of both the Phoebe Regio (V-41) and Tellus Tessera (V-10) quadrangles to ascertain their geologic history and make comparisons between these distinct upland plateaus.

Phoebe Regio: Located to the south of Beta Regio, Phoebe Regio rises to an elevation of 1.5- to 2.5-km above the surrounding plains. Although the core part of Phoebe exhibits evidence of deformation due to compression (*e.g.* near 15°S, 282°), the dominant tectonic style is characterized by intersecting and radiating sets of fractures and grabens [5,6]. The margins of Phoebe are embayed by the surrounding plains producing significant outliers and kipukas. At the scale of the Magellan data, it is not possible to distinguish layering within the high standing rock outcrops. In some locations the tessera appears to form a gradational contact with the surrounding plains. The eastern and southern margins of the elevated terrain are bound by major rift valleys (Devana Chasma and Pinga Chasma respectively). Normal faulting associated with these rifts is widely distributed and represents some of the most recent activity in this area. The extensional environment is interpreted to have facilitated widespread volcanic activity resulting in the emplacement of large edifices such as Yunya-mana Mons and a significant number of lava flow fields.

Tellus Tessera: Located to the north of Aphrodite Terra, Tellus reaches an elevation of 2.0- to 3.0-km above the adjacent plains. The geology of this part of the planet is quite complex and is generally characterized by large-scale (10s to 100s of km wide) ridges and valleys crosscut by smaller scale graben forming what has been termed ribbon terrain [7]. Geologic mapping has revealed the presence of compressional zones along the eastern and western margins of the upland. In addition, the presence of belts of ridges in the interior of this highland suggests a significant episode of collisonal activity has taken place that incorporates individual blocks of tessera. The northern part of this upland is extensively embayed by plains materials suggesting tectonic activity has given way to a predominately volcanic environment. This is also distinguished by the relatively high concentration of coronae along the northern part of Tellus. In the vicinity of Eliot Patera there is evidence for possible layering within outcrops [8]. Although of limited extent, this may suggest the presence of stacked volcanics, providing support to the assertion for variability in crustal materials within Tellus [8].

Tessera Geologic Comparisons: From the standpoint of geologic setting and morphology, there are significant differences between Phoebe Regio and Tellus Tessera. The former is dominated by an extensional environment and the latter by compression and later extension. Phoebe lacks evidence of outcrop layers (at the limit of the resolution of the data). Gradational contacts between the tessera material and the surrounding plains may indicate that parts of Phoebe may be older regional plains that have been deformed. Tellus shows evidence of limited layering within rock units and it may be made up of smaller occurrences of tessera assembled into a larger unit through collision and compression.

Regional and global-scale mapping of Venus typically classifies tessera as a single unit type. Detailed study provides insight into the geologic and morphologic variability between different occurrences of this terrain. A goal of future Venus exploration will be to understand how rock compositions vary across the planet. Additional mapping along with surface property and geophysical analysis is needed to determine sites to investigate from orbiters and landers.

References: [1] Barsukov, V. L., et al. (1986) *JGR*, 91, D378-D398. [2] Bindschadler, D. L. and Head, J. W. (1991) *JGR, 96*, 5889-5907. [3] Gilmore, M. S. et al. (1998) *JGR*, *103*, 16813-16840. [4] Hansen, V. L. et al. (2000) *JGR*, *105*, 4135-4152. [5] Bindschadler, D. L. et al. (1992) *JGR*, 97, 13495-13532. [6] Hansen, V. L. and Willis, J. J. (1996) *Icarus*, 123, 296-312. [7] Hansen, V. L. and Willis, J. J. (1998) *Icarus*, 132, 321-343. [8] Senske, D. A. and Plaut, J. J. (2009) *LPSC XL,* Abstract # 1707.