COMPARING TOPOGRAPHIC PROFILES ON VENUS AND EARTH. P. R. Stoddard[1] and D. M. Jurdy[2], [1]Dept. of Geology and Environmental Geosciences, Northern Illinois University, DeKalb, IL 60115, prs@geol.niu.edu, [2]Dept. of Geological Sciences, Northwestern University, Evanston, IL 60208, donna@earth.northwestern.edu.

Introduction: Atla and Beta Regiones on Venus are both marked by pronounced geoid and topographic highs. They are found at nodal points in a network of chasmata. Chasmata are linear to arcuate troughs with ridges extending thousands of kilometers, and may be active rift zones [1]. A third type of tectonic feature, coronae, are quasi-circular volcanic constructs large enough to depress the lithosphere upon which they sit [2]. They have been classified as "domal," "circular," and "calderic" which may reflect an evolutionary sequence from young to old [3]. As chasmata congregate at the regiones, coronae are noticeably absent [4].

Previous studies [e.g. 4, 5] have used various forms of data, such as crater morphology, terrain attitude, admittance, etc., to better understand the evolution and connection of these features. Here, we use topographic profiles to look for well-understood terrestrial analogs to Venusian features.

Profile Comparison: Topographic profiles (cross-section lines in Figure 1) are based on the Magellan (Venus) and ETOPO5 (Earth) data sets. In most cases, long wavelength trends on Venus do have analogs on Earth, primarily with mid-ocean ridges. Short wavelength features, such as rift troughs and constructional edifices, are quite different on the two planets. Profiles of Atla and Beta regions are compared with candidate terrestrial analogs Hawaii and Iceland (Figure 2*a*, *b*). Interestingly Atla bears more resemblance to Iceland than to Beta. Analogs to both fast (e.g. the EPR, Figure 2*c*) and slow (MAR, Figure 2*d*) terrestrial spreading centers can be found on Venus.

Conclusions: Comparison of topographic profiles from Venus and Earth may lend insight into tectonic features and activity on our sister planet. Long wavelength features appear similar to spreading systems on Earth, suggesting a deep, thermal cause. Short wavelength features are quite different, however, as expected based on the vastly different surface conditions. Despite some overall similarities between Atla and Beta Regiones, differences do exist in their profiles, which may reflect different processes or stages of evolution.

References: [1] Stofan, E. R., et al., (1992), *JGR*, *97*, 13,347-13,378. [2] Solomon, S.C. et al. (1992), *JGR*, *97*, 13,199-13,255. [3] DeLaughter, J.E. and Jurdy, D.M. (1999), *Icarus*, *139*, 81-92. [4] Stoddard, P. R and Jurdy, D. M. (2003) *LPS XXXIV*, Abstract #2129. [5] Basilevsky, A.T. and Head, J.W. III (2002), *Geology*, *30*, 1015-1018. [6] Price, M. H., (1995) Ph. D. Dissertation, Princeton University, Princeton, NJ, 177 pp.

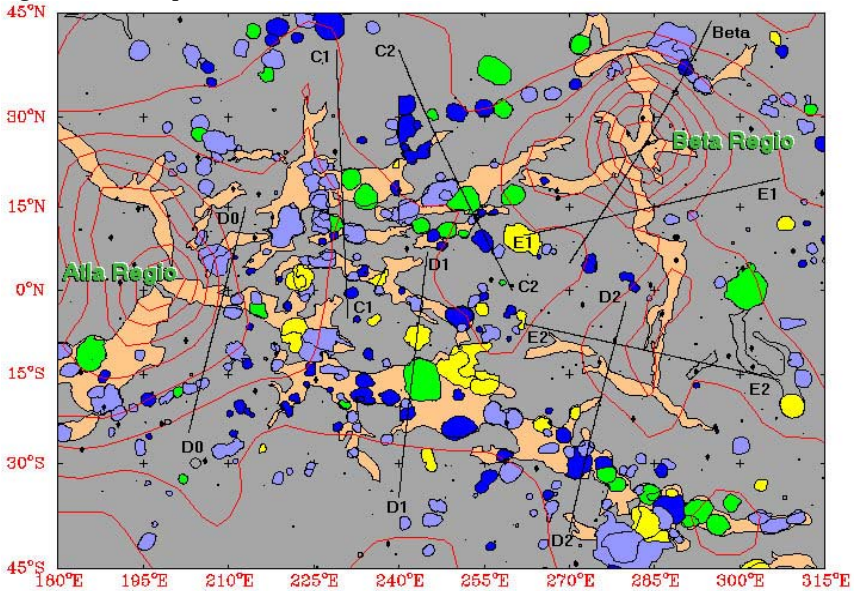

Figure 1: Chasmata (orange) [6], coronae, and geoid (red contours) in the B-A-T region of Venus. Color scheme for coronae (yellow, green, blue) is based on the domal, circular, calderic classifications [3]. Unclassified coronae are purple. Cross-section lines used in this study are also shown.

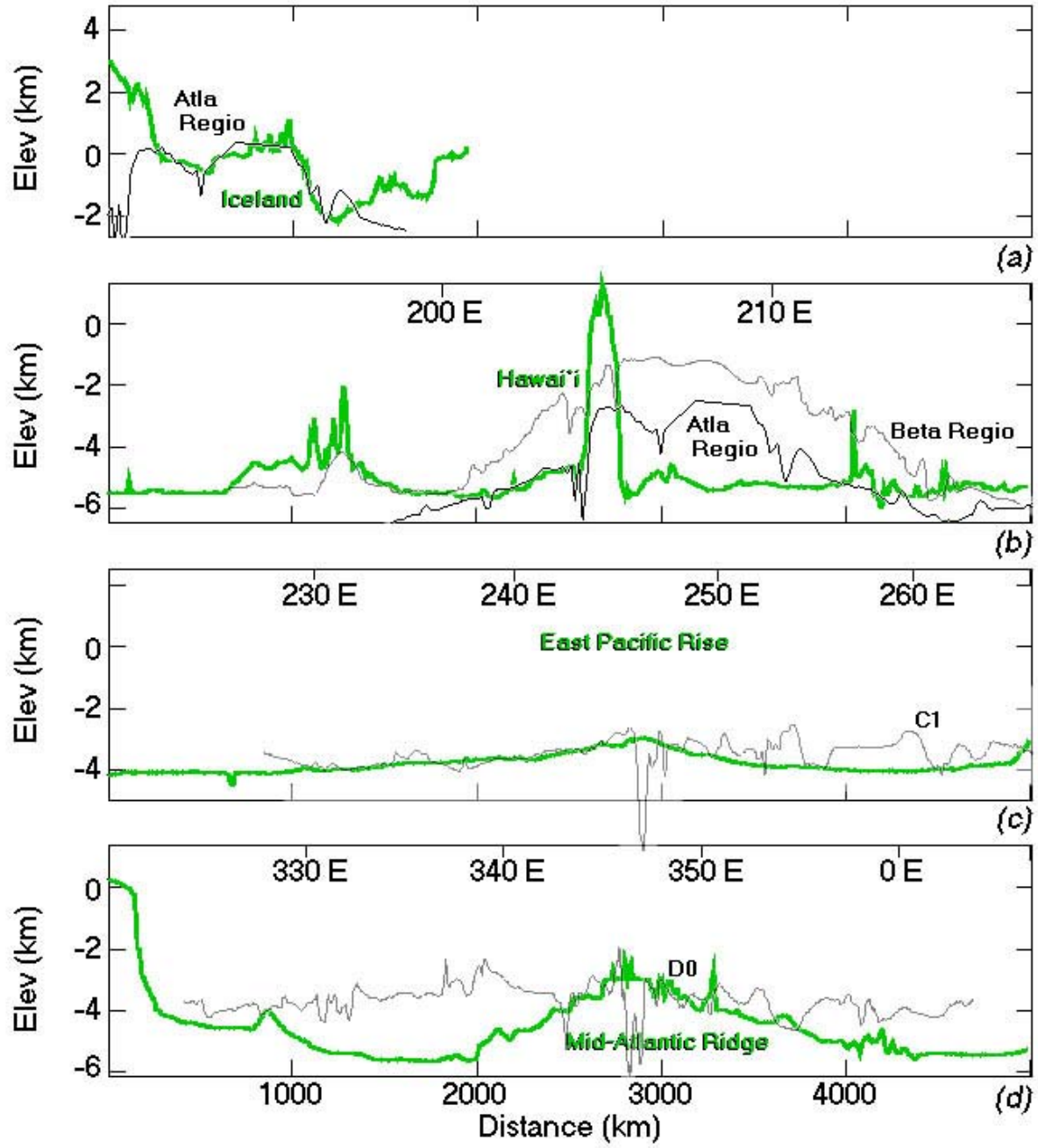

Figure 2: Comparison of topographic profiles from Venus and Earth. Scales are identical for all profiles.