candidates for origin and production of the trough-and-ridge tessera terrain type on Venus. In this model, elongate troughs are analogous to fracture zones, and linear elements of the corrugated terrain to abyssal hills; the trough-and-ridge tessera originated at a rise crest analogous to divergent boundaries and spreading centers on the Earth's seafloor and evolved to its present morphology and configuration through similar processes of crustal spreading.

If trough-and-ridge tessera fabric is produced by crustal spreading, where is the spreading center located in Laima Tessera? On the basis of the asymmetry of the fabric, candidate spreading centers would be expected to be found parallel to the corrugated terrain and normal to the trough/fractures, oriented in an approximately NNE-SSW direction (Figure 1*c*). If the crust and lithosphere is relatively old, topographic variations due to thermal evolution may no longer be detectable. At active spreading centers on Venus topographic rises should be preserved and detectable for relatively slow spreading rates [*Kaula and Phillips*, 1981; *Phillips and Malin*, 1983]. Alternatively, regional slopes might provide information on the direction to higher, younger crust and lithosphere. Preliminary analysis of topograpic contour maps (500-m contour interval) has revealed no distinctive local rises, but more detailed analysis is underway using individual altimetry profiles. Although there does not appear to be a systematic trend in regional topography in an E-W direction, the extent of volcanic flooding of Laima Tessera appears to be greater in the west (Figure 1*c*), suggesting that the eastern portion of Laima may be slightly higher, and thus a candidate for younger crust and lithosphere. The eastern boundary of Laima Tessera is characterized by a complex NNW striking ridge belt and a topographic drop of several kilometers, suggesting the presence of a tectonic boundary (Figure 1*c*). Detailed mapping from Venera 15/16 altimetry and images of Laima Tessera is presently underway to document topographic trends and to locate possible spreading centers.

The trough-and-ridge tessera terrain in Laima Tessera lies between Ishtar Terra in the north (a region of compressional deformation and crustal thickening [*Crumpler et al.*, 1986; *Vorder Bruegge and Head*, 1989]), and equatorial regions of extensional deformation [*Schaber*, 1982] in Aphrodite Terra to the south (Figure 1*a*). Patterns of topography, morphology, and structure comparable to terrestrial spreading centers have been observed in the Western Aphrodite Terra region several thousands of kilometers to the south of Laima Tessera [*Crumpler et al.*, 1987; *Head and Crumpler*, 1987; *Crumpler and Head*, 1988] (Figure 1*a*). Although high-resolution images of the Venera 15/16 mission are not available at these low latitudes, evidence exists from Pioneer Venus and Arecibo data for the presence of a spreading center. Observations from Western Aphrodite Terra show (1) a segmented rise crest offset right-laterally along fracture zone-like cross-strike discontinuities (similar to the troughs in Laima Tessera); (2) bilaterally symmetrical topography normal to the rise crest; and (3) a thermal boundary layer topography suggesting spreading rates of about a centimeter a year and Iceland-like plateaus. Also revealed in the moderate resolution images and topography data are patterns of orthogonal elements parallel to the rise crest and in the general direction of the cross-strike discontinuities (Crumpler and Head, Crustal spreading on Venus: Evidence from topography, morphology, symmetry and map patterns, submitted to *Tectonophysics*, 1989). In addition, the radar properties of the Western Aphrodite Iceland-like plateaus along the rise crest (Ovda and Thetis regiones) are very similar to those of the tessera (such as Laima and Tellus) in the regions covered by Venera 15/16. High-resolution Magellan data will permit a comparison between Laima Tessera and the terrain and structure in Aphrodite Terra and the nature and relationship of the intervening region.

The more complex tessera patterns observed by Venera 15/16 (subparallel ridged terrain and disrupted terrain [*Bindschadler and Head*, 1988*b*] are not discussed in this paper but could be due to deformation of the basic trough-and-ridge tessera pattern (analogous to more complex patterns seen on the terrestrial seafloor [*Acton et al.*, 1988; *Stoddard*, 1987]), or to complex tectonic patterns from other sources of deformation (Bindschadler and Head, Models for the origin and evolution of tessera terrain, Venus, submitted to *Journal of Geophysical Research*, 1989). Recognition of the key basic patterns of the trough-and-ridge tessera (long troughs/fractures and short orthogonal corrugated terrain) could provide a "marker" structural type and help in deciphering the origin of the more complex tessera occurrences.

In conclusion, the similarities in morphology, geometry, and spacing of elements of the trough-and-ridge tessera to the terrestrial ocean floor fabric suggest that trough-and-ridge tessera may have formed by similar processes of divergence and crustal spreading on Venus. This hypothesis can be further tested by detailed analyses of the nature of Laima Tessera and other tessera in the northern hemisphere, application of models for the formation of fracture zones and abyssal hills on Earth to the conditions of the Venus environment, and the analysis of global high-resolution imaging, altimetry, and gravity data from the Magellan mission.

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