MORPHOSTRUCTURAL ANALYSIS OF ISHTAR TERRA, VENUS. V.J. Finn, V.R. Baker and G. Komatsu, Geosciences and Planetary Sciences, University of Arizona, Tucson, AZ 85721.

The technique of morphostructural analysis [1,2] was applied to the basic topography [3] available for Ishtar Terra from Venera 15/16 data. This analysis was performed without regard to various genetic interpretations that have been ascribed to the region [4,5,6]. The result is an identification of overlapping concentric structures (megaconcentric structures) (Fig.1) remarkably similar to ancient morphostructure chains in Siberia [7]. The pattern of megaconcentric structures is also remarkably consistent with the basic geological units (Fig.2) mapped by Sukhanov et al.[8].

By analogy to terrestrial megaconcentric structures [9], we conclude that Lakshmi Planum is a persistent structural block of orthogonal form surrounded by active belts of concentric uplifts, chains of concentric structures and liner dislocations of different orders and types. We note that extensive evidence for extensional tectonics was recently revealed by Magellan radar mapping imagery of the mountains surrounding Lakshmi [10], which is consistent with our interpretation.

Central Lakshmi has been transformed to a volcanic plain [11], which we interpret as the initial digestion of the hard Lakshmi mega-block by the subcrustal hot spot activity responsible for the more active marginal megastructures. Our proposed model of dynamical hot spot complexity differs from that of simple cylindrical mantle upwelling [12,13]. The marginal megaconcentric structures are probably the surface manifestation of hot spot activity beneath and surrounding a pre-existing block of tessera as proposed by Grimm and Phillips [14]. Volcanism, forming prominent channels in Freyja and Danu Montes [15], also seems consistent with this conceptual scheme.

Note that the marginal concentric structures are of different orders and types, consistent with Earth-derived classifications [1]. The structures exist in hierarchical arrangement, related to the radial tension generated at the larger scales. Such morphostructural analysis of Venus that points to important similarities and differences with Earth.

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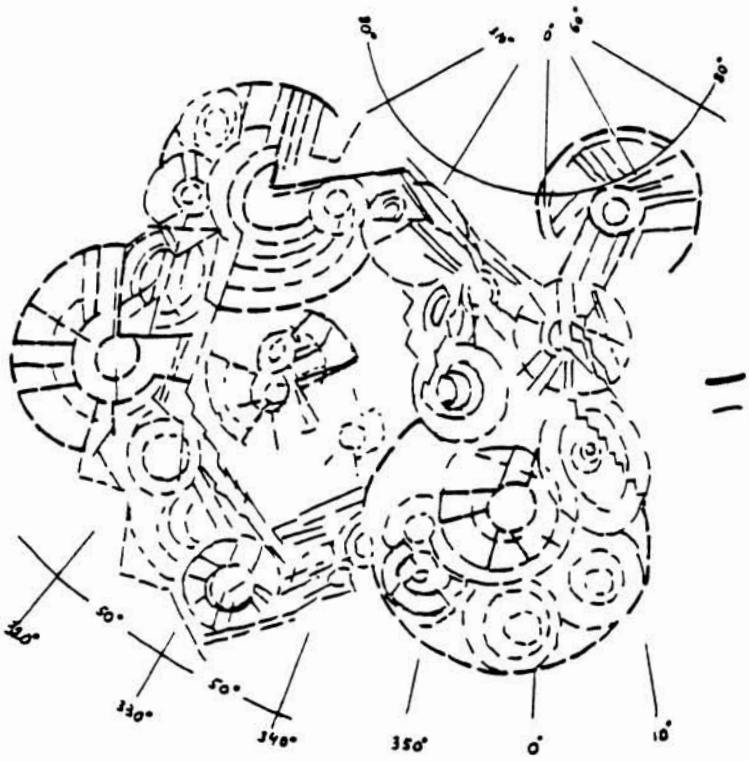
Fig.1. MORPHOSTRUCTURAL SCHEME OF ISHTAR, VENUS.
by V.J.Finn



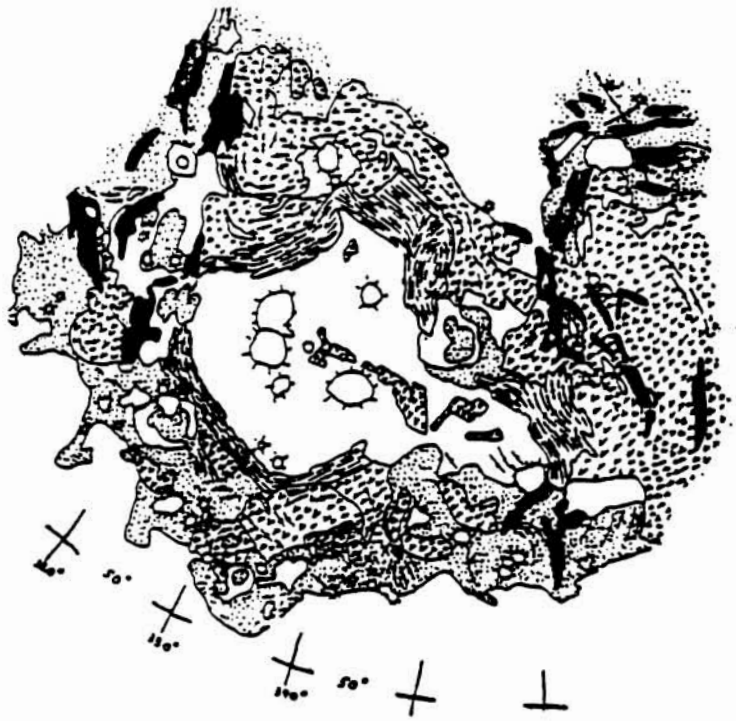


Fig.2. GEOLOGIC MAP OF ISHTAR