Compressional Tectonics in the Evolution of Ovda Regio, Venus

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The structural architecture of the Ovda Regio, the largest crustal plateau of Venus, derived from regional and local scale structural mapping of several key segments, reveals a new tectonic perspective that deviates from most of the known tectonic models. The structural features such as major shear zones, fold forms of different scales, shear zones, ribbon structures and a range of kinematic indicators. While the western Ovda is marked by concentric folding, the eastern Ovda is characterized by shear folding. Two mega shear zones are recognized: dextral NW-SE trending and a complimentary sinistral NE-SW trending zone. Two tectonic stages can be identified in a coherent and continuous strain history. The first tectonic event is related to N-S oriented compressional tectonics which culminated in the development of regional east-west folding involving primary layering. The fold forms of Ovda Regio provide fundamental structural architecture in the form of a mountain fold thrust belt. Ribbon structures display a broad radial pattern, which seems to have been developed contemporaneously with the first folding event. The second tectonic stage saw the development of a conjugate pair of mega-shear zones and a range of kinematic indicators, consistent with continued N-S oriented compression and the pre-existing fold pattern was modified resulting in the development of new set of fold structures, particularly in the eastern Ovda. The structural characteristics of Ovda Regio are analogous to those of Himalaya-Tibet collision front and also the Precambrian mobile belts of southern India.

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