

Ceres: Tectonic features juxtaposed with analogies on other planetary bodies

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ABSTRACT

Analysis and interpretation of tectonic features on Ceres' surface, plays an important role in understanding and reconstructing the history and surface formation. The most common tectonic structures on Ceres are troughs, ridges, scarps, fractures, depressions and domes. Analogues can be found on other planetary bodies like Enceladus, Ganymede, Europa or Mercury.

Current investigations of the surface reveal that some tectonic structures seem to be caused by interaction of extensional tectonics and impact cratering. An example is the Urvara crater (46°S and 249°E), which shows radial depressions out of the craters interior. Analogue structures can be found on Mercury. We assume that tectonic deformations influence the appearance of craters and crater walls. Many of frequently subparallel fissures seem to appear in combination with smooth material. Patterns similar to fractures, cracks and scarps on Ceres can also be found on Enceladus, Europa and Mercury. On Enceladus e.g. in form of the "tiger stripes" or on smaller scale as structures intersecting cratered terrain. Analogies to ridges on Ceres' surface are existent on Enceladus, Europa and Ganymede, but they are more dominant, complex and more regular shaped. Troughs are relatively rare on Ceres' surface. However, similarities are evident on Enceladus and Mercury, and could also be related to those on Europa and Ganymede.

The determination of Ceres' tectonic features caused by deformation processes and the comparison with structures on other planetary bodies will allow us to reconstruct formation processes, the surface morphology, and the topographic signature.

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