



The double rift system of Coracis Fossae - a specific style of crustal extension on early Mars?

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We make use of High Resolution Stereo Camera (HRSC) - imagery and MOLA-data for detailed photogeological mapping and comparative studies of rift-like structures on Mars. The present study focuses on the two rift-like graben systems of Coracis Fossae in southeastern Thaumasia. The Coracis Fossae have been mentioned as a possible rift-structure in previous publications but no detailed structural investigation has been performed yet.

HRSC-imagery shows two neighbored rift-like graben systems 70 - 100 km apart and in an nearly subparallel setting. Observable length of individual rifts is up to 600 km. Rift graben are 10 - 40 km wide. Mapped overall dimensions, complex morphology, segmented border faults arranged in an echelon patterns, segmentation, curvilinear trend, half graben, flank uplift, fractured graben floors and associated volcanism suggest that both graben systems are independent rifts and lithosphere has been involved in rifting. A topographical map derived from HRSC- and MOLA-data indicates that rift formation is associated with broad domal uplift. Both rifts cross the Warrego topographic high an assumed magmatic center. We use rift topography to constrain the elastic and associated mechanical thickness and heat flux at the time of rifting. To constrain the time of rift formation, we perform crater counts on several rift - related geologic units based on new HRSC - images. We discuss possible ambient conditions that could lead to formation and development of a double rift system on early Mars.