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Geomorphological characteristics of Mariner Valley on Mars. In the search for evidences of its origin

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The Valles Marineris system is the unique morpho-tectonic structure on Mars. This crack in Martian lithosphere, stretches latitudinally for about 4,000 km. Its deph reaches 11 km, with slopes reaching 70-80º.
It is seen on maps that this system is the central part of a larger topographic structure, formed by two “rings” - Capri Chasma – Ares Valle – Sharonov - Echus Chasma (NE ring), and also by the arc Clarita - Bosphorus (SW ring). Altogether they form figure «8» with the axes oriented NE – SW. Center of «8» coincides with the center of the Valles Marineris system. We will call 8-like structure described above as the «Loop Marineris» structure.
The Valles Marineris system itself has a complex structure. Its western part is made by canyons Ius Chasma on the south, and Titon Chasma on the north. The central valley - Melas Chasma – joins the system of intersecting valleys Candor Chasma, and in the east it joins the long, stretched valley Coprates Chasma.
Locaion of Valles Marineris, on the top of elevated tectono-volcanic plato, similar to that of earth ridges, brings us to idea of its endogenic origin.
Rose-diagrams of linear relief forms show the dominance of directions: 86-95º, 101–110º, 121-125º, 136-140º. That is all the 4 regmatic systems – meridional, latitudinal, and two diagonal NE SW, are presented in this Martian fractures and lineaments network. We consider this as an evidence of participation rotational forces in formation of this system. Systems 101-110º 121-125º are created, possibly, by a torque, as a result of equatorial right hand shift of Mars crust structures. Possible, the system Loop Marineris is created by clockwise rotation of a block of Martian crust, containing Valles Marineris.
The similar near equatorial left hand side shear dislocations of Isthmus of Panama and Sunda Islands – Melanesia arcs observed on the Earth are twisted counterclockwise.
SW ring of Loop Marineris is spatially related to the elevated part of Martian surface – Tharsis Plato, and to some extend is antipodal to the most depressed part of the Martian topography - Hellas plane.
The NE ring of Loop Marineris is commpiled manly by the “negative” forms of relief – valleys and canyons. This is in clear correspondence with the averaged lowered level of the Northern hemisphere Martian topography. SW ring on the contrary, is made by the positive forms of relief. And this is in correspondence with the averaged elevated level of the South hemisphere topography. This observations speak in favor of formation of Loop Marineris and Valles Marineris by the same forces of the planetary scale that have formed the topographic dichotomy of N and S Mars hemispheres.
Thus, the rift-like system Valles Marineris, being the part of larger structure Loop Marineris, has been formed by radial, latitudinal and longitudinal stresses under the action of endogenic and rotational forces.