

**COMPARATIVE PLANETOLOGY: CORONAE ON VENUS, MARS, AND EARTH.**

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Coronae are amongst the most characteristic features on the surface of Venus. These more or less circular features of endogenic origin range in diameter from some 10s of kilometers up to appr. 850 km (Heng O) and up to appr. 2,500 km in diameter (Artemis). Their origin was probably in all cases related to upwelling of magma (plume) which caused a variety of typical features (circular ridges and depressions, circular fractures and numerous volcanic features: appr. radial lava flows, shields, and shield fields [1].

On Mars there is probably but one real corona-like structure, Alba Patera. That huge shield volcano-like feature is characterized by numerous large arcuate grabens which encircle the entire centre of Alba Patera, however, they do not form a complete ring structure. The whole area is probably a region of delatation [2]. Both together, the central shield and the inner part of the circular grabens, have a diameter of about 400 km. As the grabens spread very much laterally the bulk diameter of the whole structure is over 1,000 km. Especially the concentric fractures and the radial flows render the centre of the whole structure very corona-like. This is also accentuated by geophysical data which indicate the existence of an upwelling magma plume [3].

Similar features with the same spatial distribution can be detected in the area of Noctis Labyrinthus which is characterized

by huge tectonic troughs, which surround Syria Planum along its northern boundary and form a semicircular structure. The southern boundary is indicated by much smaller arcuate fractures which are barely visible. The centre of Syria Planum displays a set of very small volcanic features, which call into mind the venusian shield fields which typify coronae.

It seems to be possible that at least some arcuate fractures encircle parts of Olympus Mons. However, as nearly the entire vicinity of that huge shield volcano is covered by young lavas it remains so far an open question whether or not that huge volcano indicates the centre of a corona-like feature.

Very little is known so far about corona-like features on Earth. One candidate for such a feature might be the Brandberg in Namibia, a pluton which stands appr. 1,400 m above the mean level of the surrounding erosional plain and is appr. 25 km in diameter. This mesosoic intrusion, a batholith, probably developed a younger extrusional activity; this situation can be compared in general with Alba Patera, Mars and with numerous coronae on Venus.

**References:** [1] Stofan, E.R. et al. (1992): Journ. of Geophys. Res., Vol 97, No. E8, 1992: 13 347 - 13 378. [2] Raitala, J. (1988): Earth, Moon, and Planets Vol. 42: 277 - 291. [3] Janle, P. and Erkul, E. (1991): Earth, Moon, and Planets Vol. 53: 217 - 232.