

CORONAE OF VENUS: TOPOGRAPHY AND VOLCANIC PRODUCTIVITY

E.N. Guseva, M.A. Ivanov

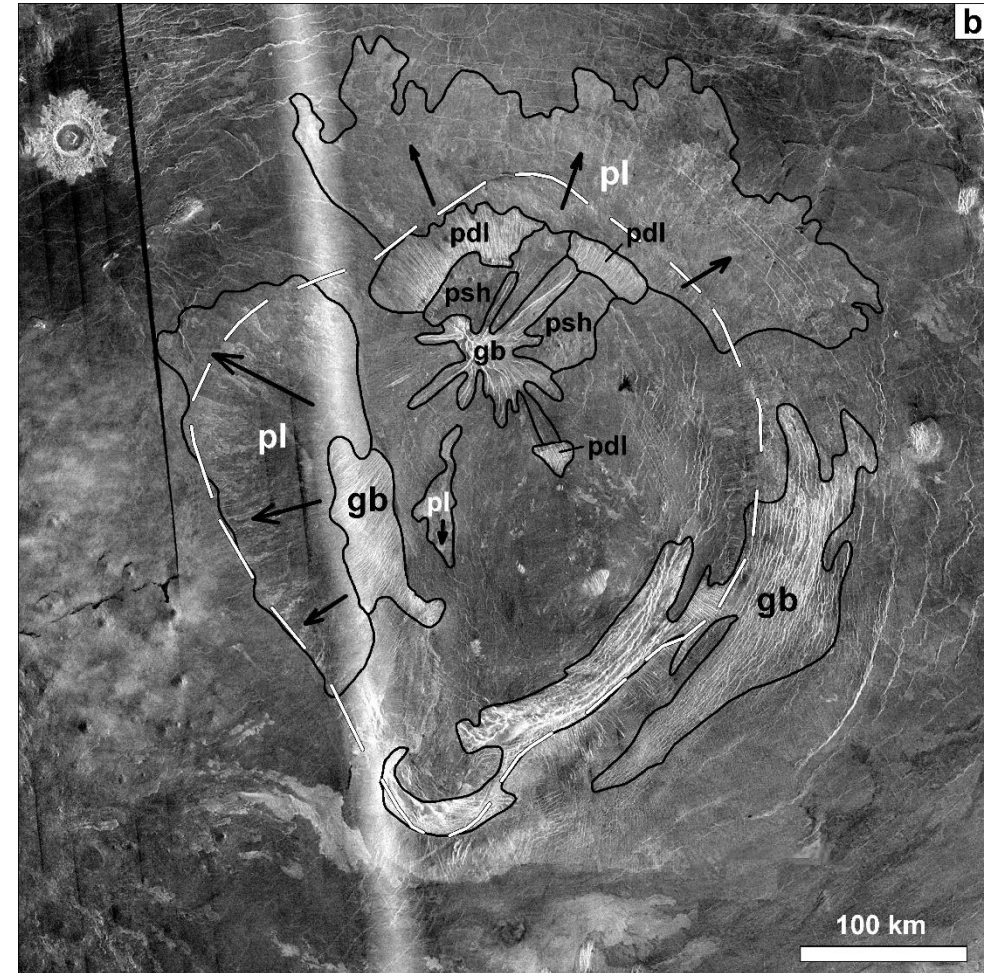
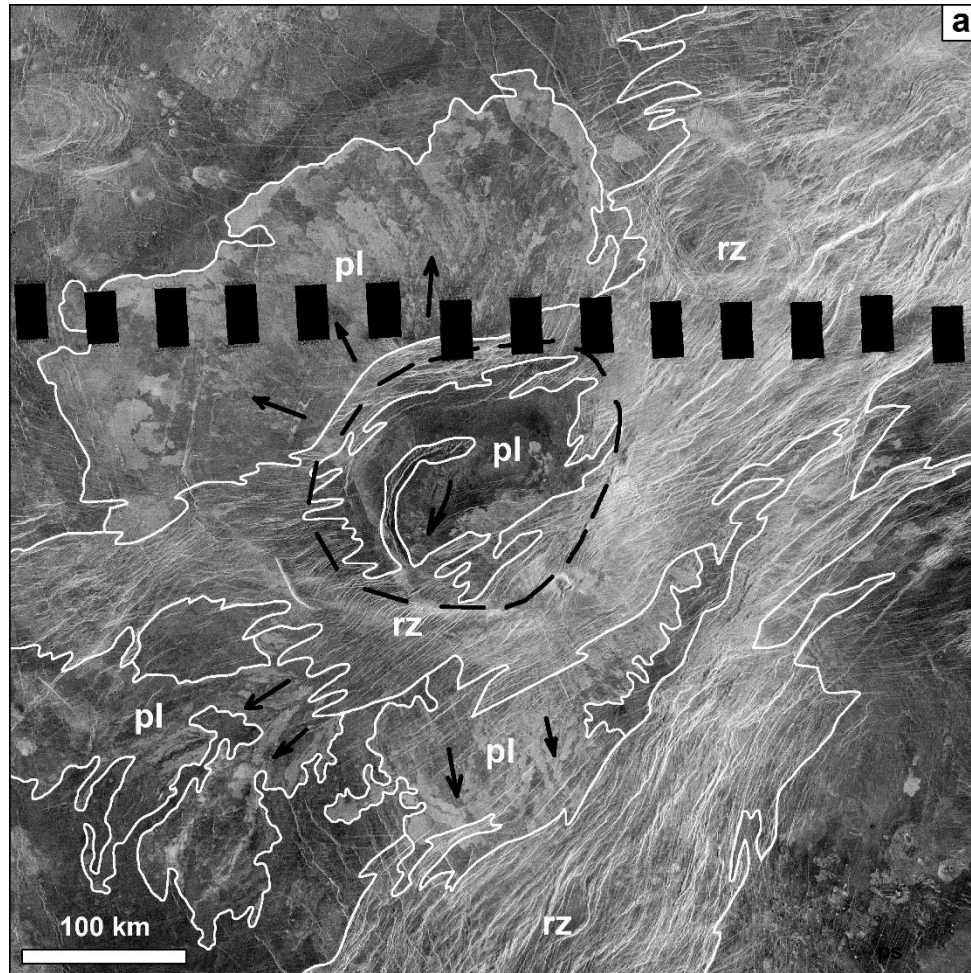
Vernadsky Institute of Russian Academy of Science
Laboratory of comparative planetology

contact: guseva-evgeniya@ya.ru

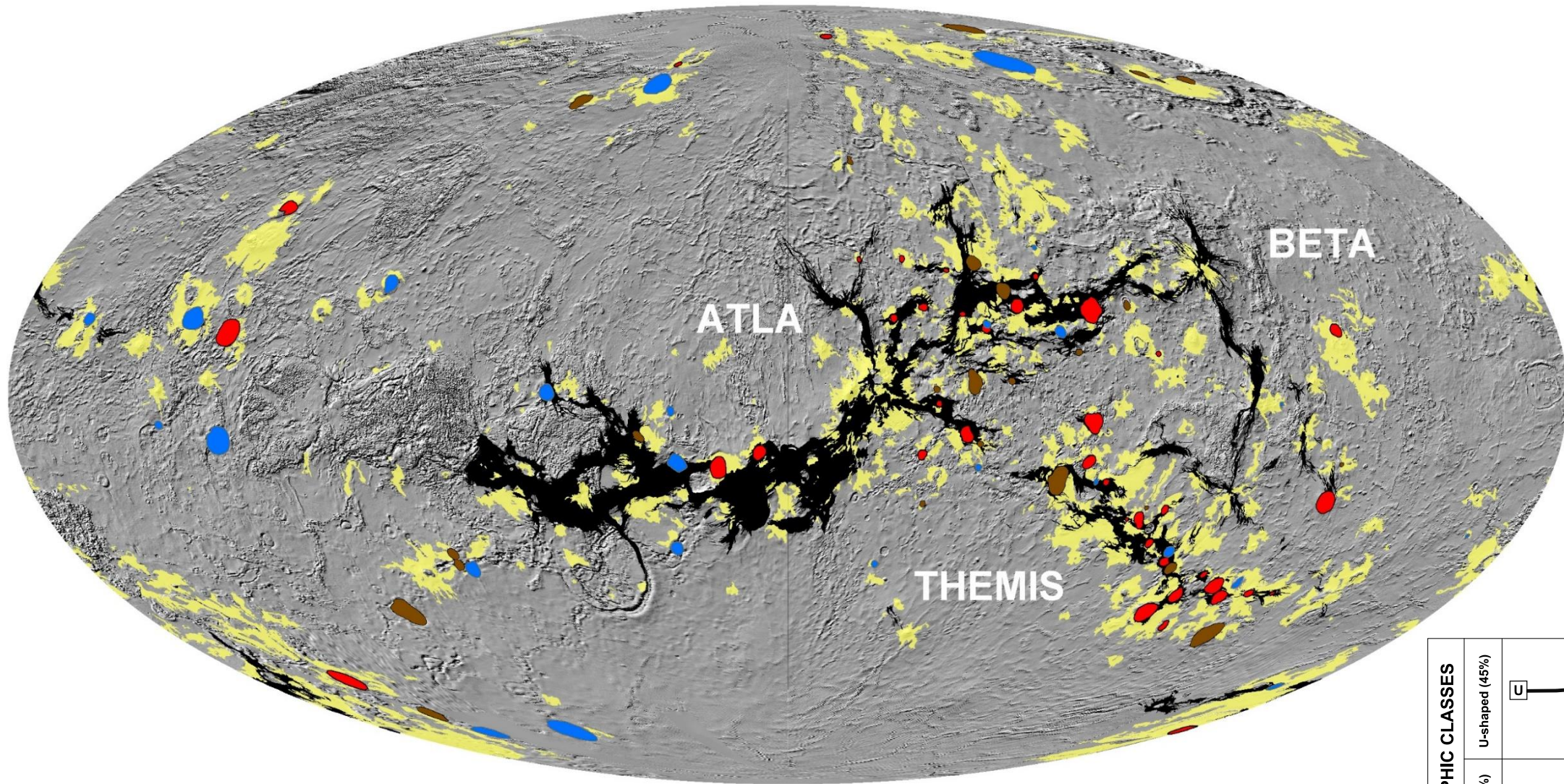


THE STUDY HIGHLIGHTS

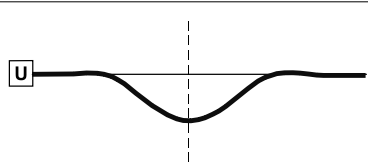
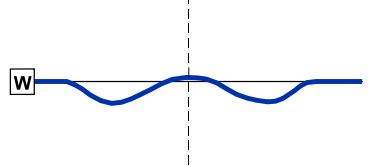
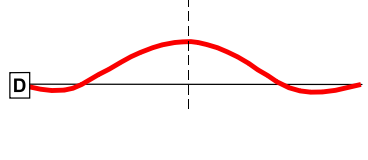
We identified that 90 coronae that are unambiguous sources of youngest volcanism (lobate plains). These coronae constitute ~ 17% of the entire population. We estimated areas of the corona-related lobate plains to study volcanic productivity of the coronae.



Coronae-sources of lobate plains: (a) Nahas-tsan Mons is framed by fractures of rift zones, the sources of lobate plains (black arrows); (b) Ereshkigal is framed by fractures of the groove belts with a radial graben system (nova), which is the source of the lobate plains (black arrows).



Coronae that are the sources of lobate plains. Their specific topographic classes are marked in color on the map: D (red), W (blue) and U (brown), lobate plains - yellow, rift zones - black, geological base from [Ivanov, Head, 2011].

CORONAE TOPOGRAPHIC CLASSES			REGRESSIVE STAGE
U-shaped (45%)			
W-shaped (37%)			
D-shaped (18%)			PROGRESSIVE STAGE

THE STUDY CONCLUSIONS

Our study of coronae allows us to draw two main conclusions:

1) Only ~ 17% of all coronae of Venus are the sources of young lavas that form lobate plains. The small proportion of such coronae suggests a decrease of volcanic productivity of coronae and, perhaps, the rate of formation of mantle diapirs.

2) The ratio S_a/S_c is negatively correlated with the corona diameter. This is possibly only if: (1) the area of the lobate plains apron is proportional to the corona diameter or (2) the area of the apron decreases as the corona diameter increases.

We now are developing criteria to assess these possible models.

Full version: Guseva E.N., Ivanov M.A. Coronae-sources of young volcanism on Venus: topographic features and estimates of productivity. Solar System Research. 2024. V.58. N1. In print.

