Tectono-magmatic evolution of asymmetric coronae on Venus: Topographic classification and 3D thermo-mechanical modeling

Anna J. P. Gülcher, T.-Y. Yu & T. V. Gerya, 2023, *JGR – Planets*,
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We present a new joint numerical modelling and mission data analysis study on large asymmetric coronae on Venus

Topographic classification

- We characterize the topographic radial (a)symmetry and the regional setting of the 155 largest coronae on Venus
- Many coronae are situated at a topographic transition of a lowland and elevated plateau ('topographic margin')

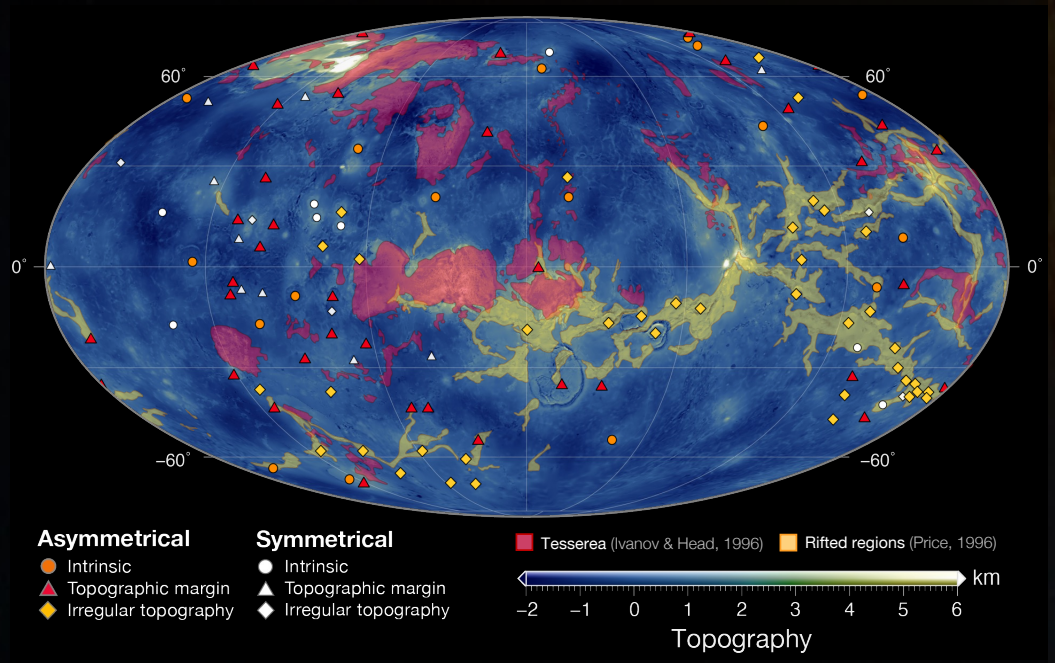

Fig. 1: Topographic map with our coronae classification, and tesserae and rifts.

3D tectono-magmatic modelling of plume-margin interactions

- Several **geodynamic styles** create asymmetric coronae at topographic margins: lowland-sided subduction, plateau-sided dripping, and an embedded plume
- The lateral **gradient in lithospheric strength** controls these styles
- **Eclogite matters** and strongly controls the degree of crustal recycling
- Asymmetric coronae **are longer-lived structures** than symmetric coronae

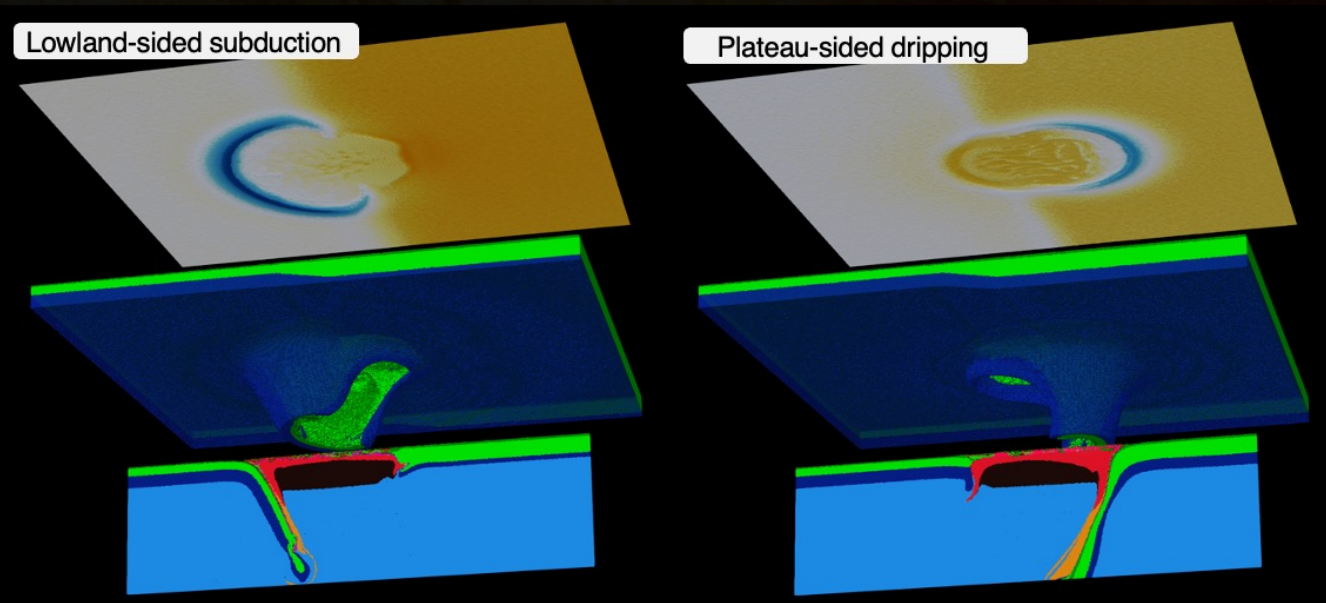

Fig. 2: Two models, showing topography (top) and composition (bottom), that display two end-member tectonic styles

This dataset is available on Zenodo, DOI: 10.5281/zenodo.8316805