Geodinámica de Venus

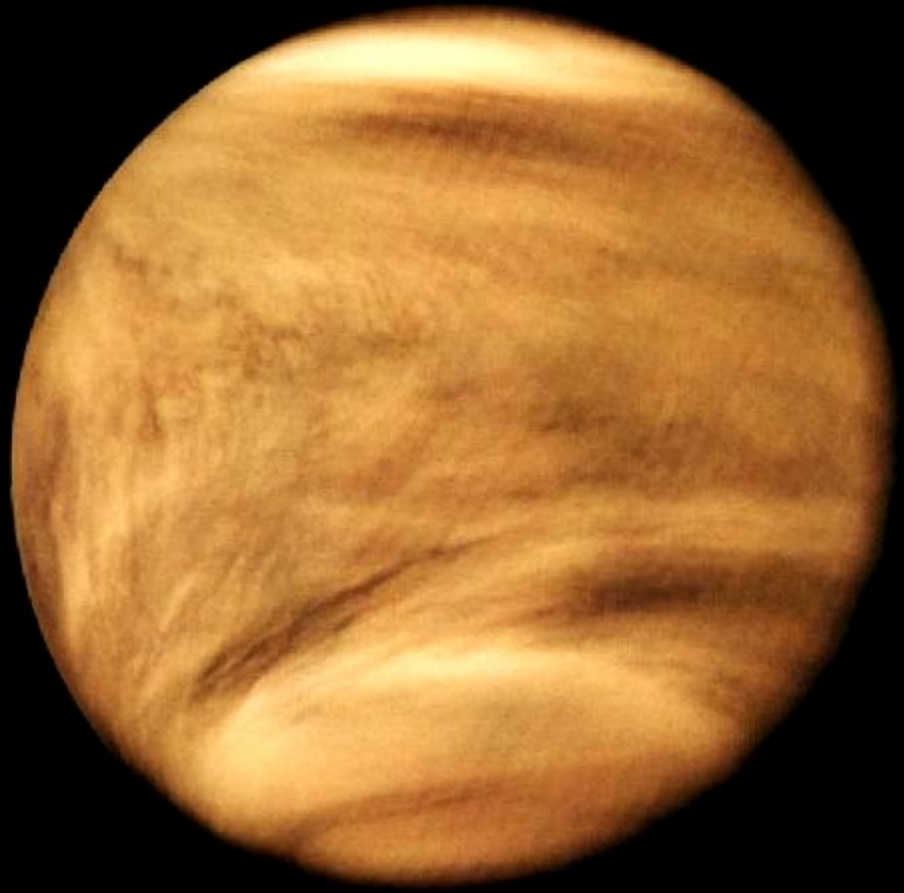
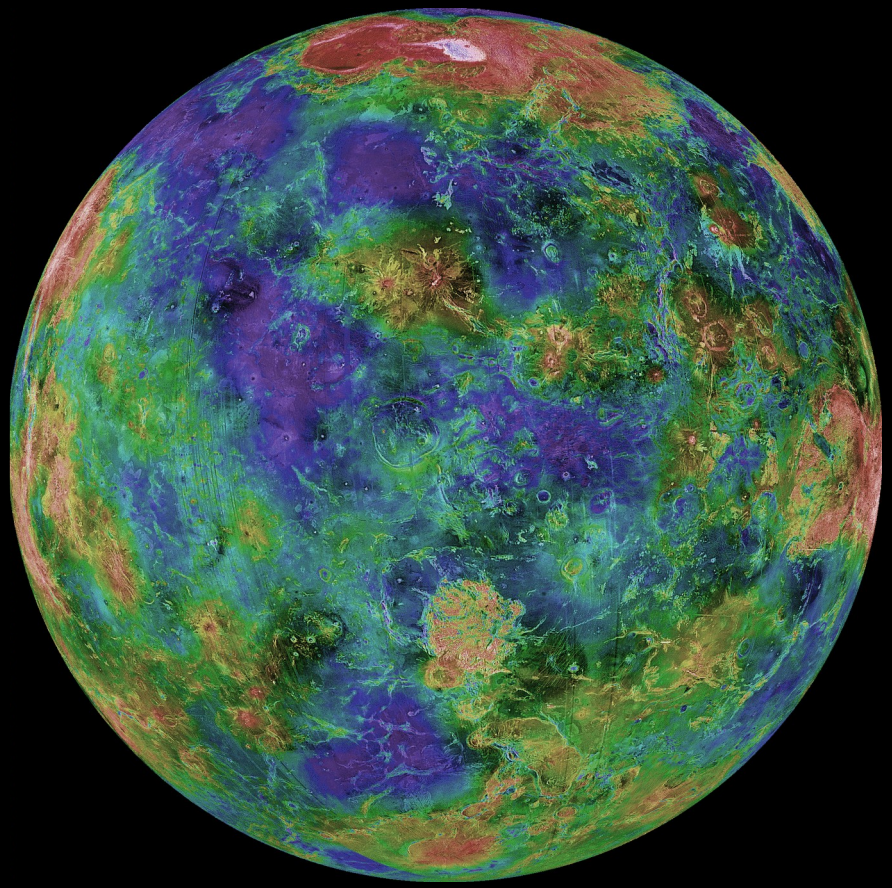
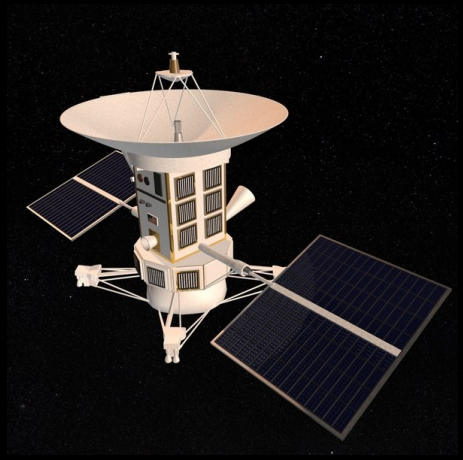
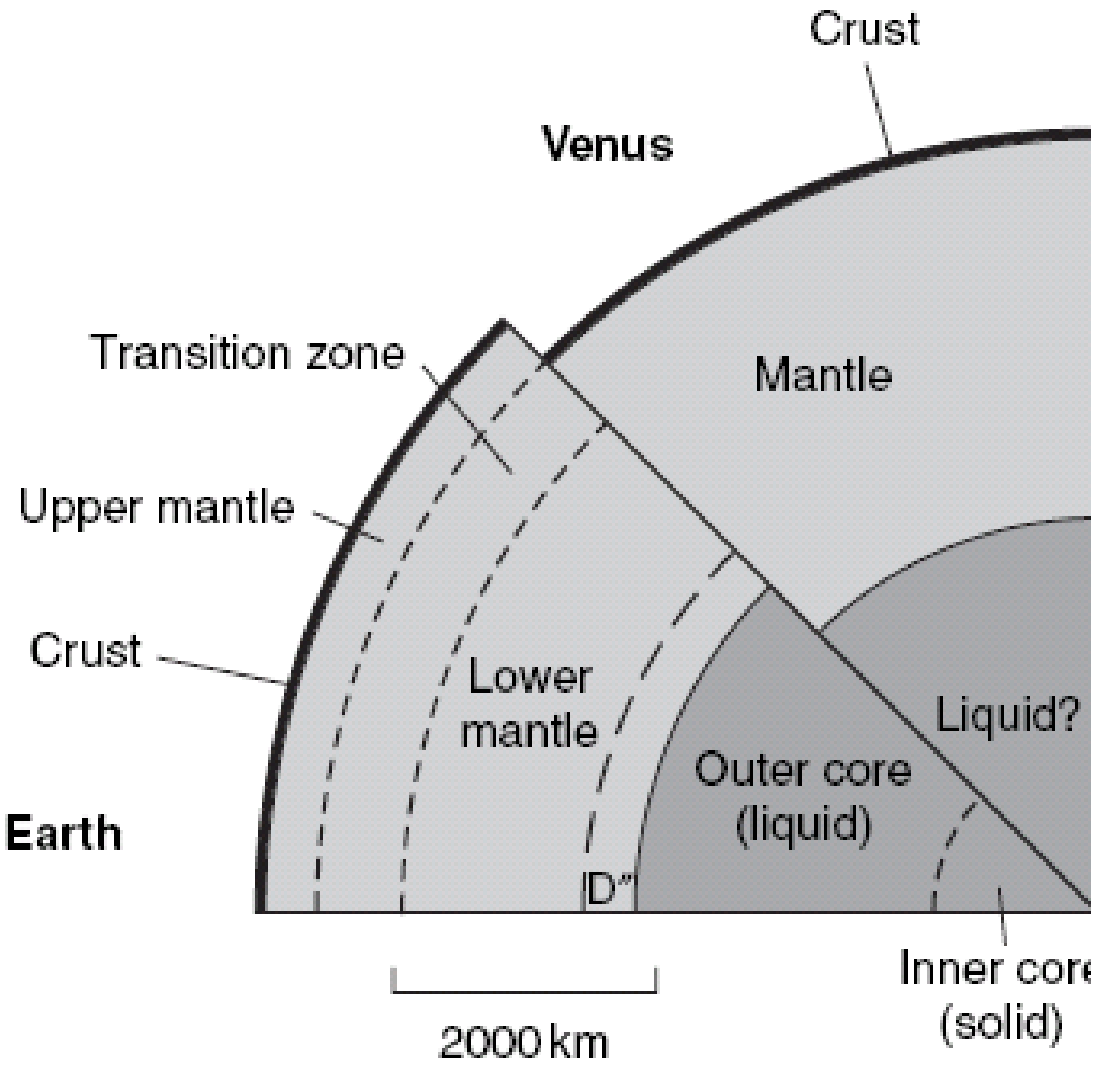


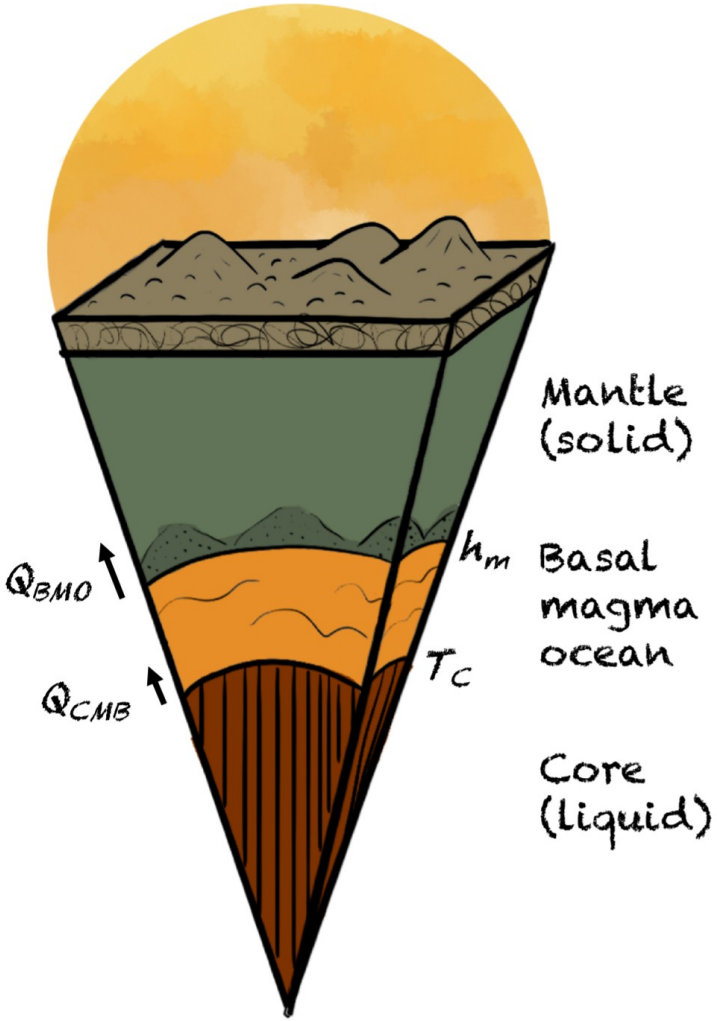
Imagen obtenida por la sonda Pioner Venus en 1979



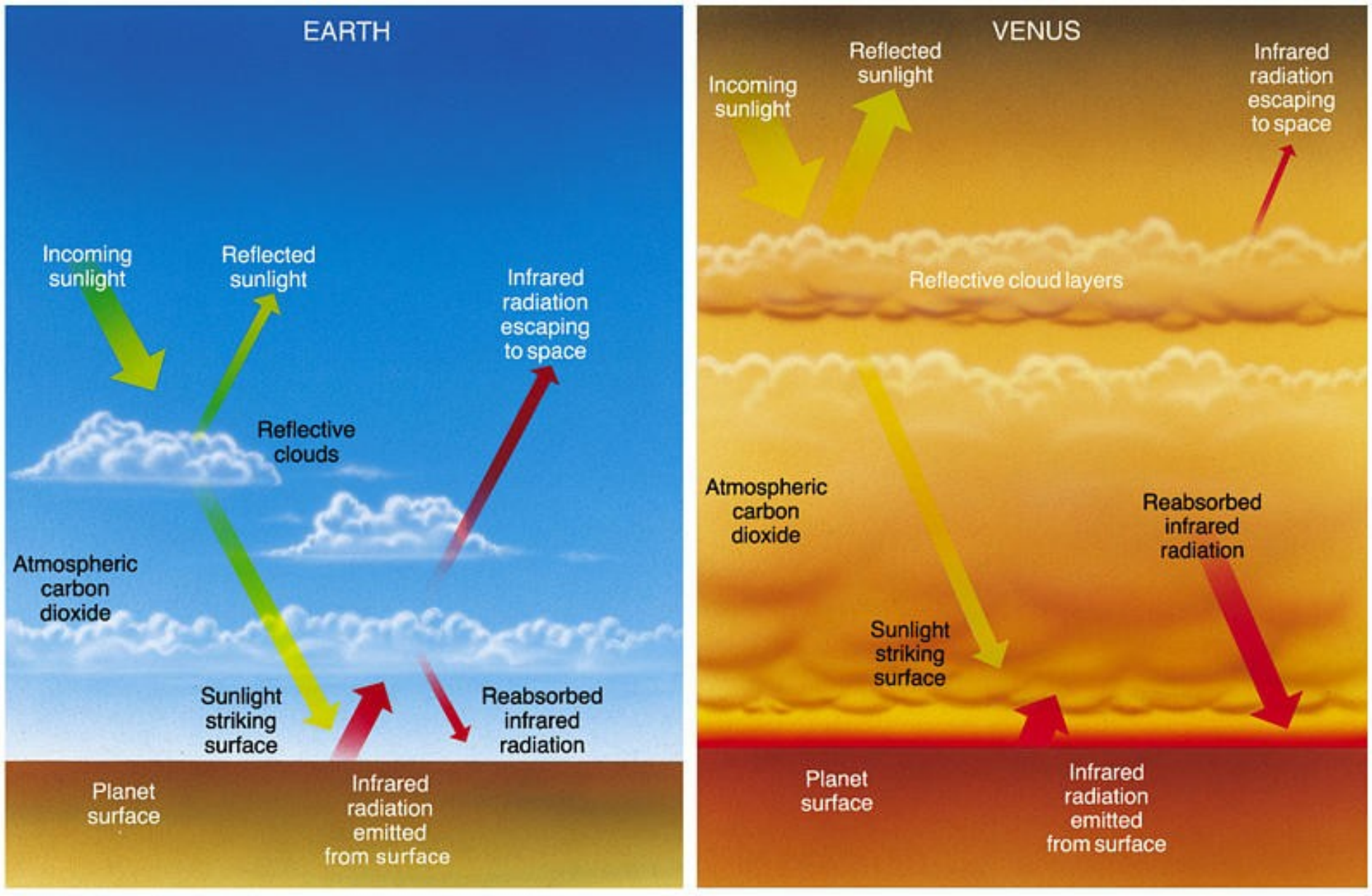


Proyección esférica de las imágenes de radar más la topografía obtenidas por la sonda Magallanes entre 1990-1994


Crust
Venus
Transition zone
Mantle
Upper mantle
Crust
Lower
mantle
Liquid?
Outer core
(liquid)
Earth
D"
Inner core
(solid)
2000 km

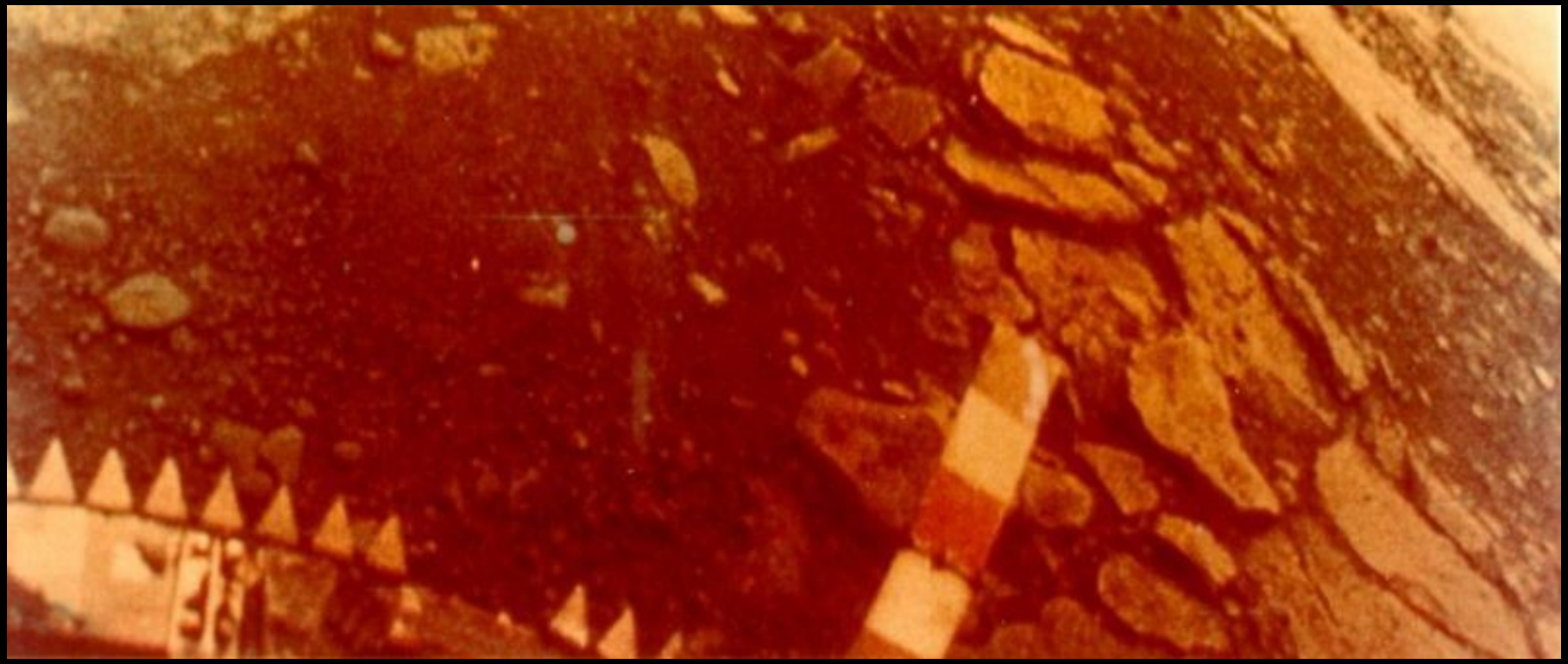

Mantle
(solid)
h_m
Basal
magma
ocean
Q_{BMO}
T_C
Q_{CMB}
Core
(liquid)

Efecto invernadero



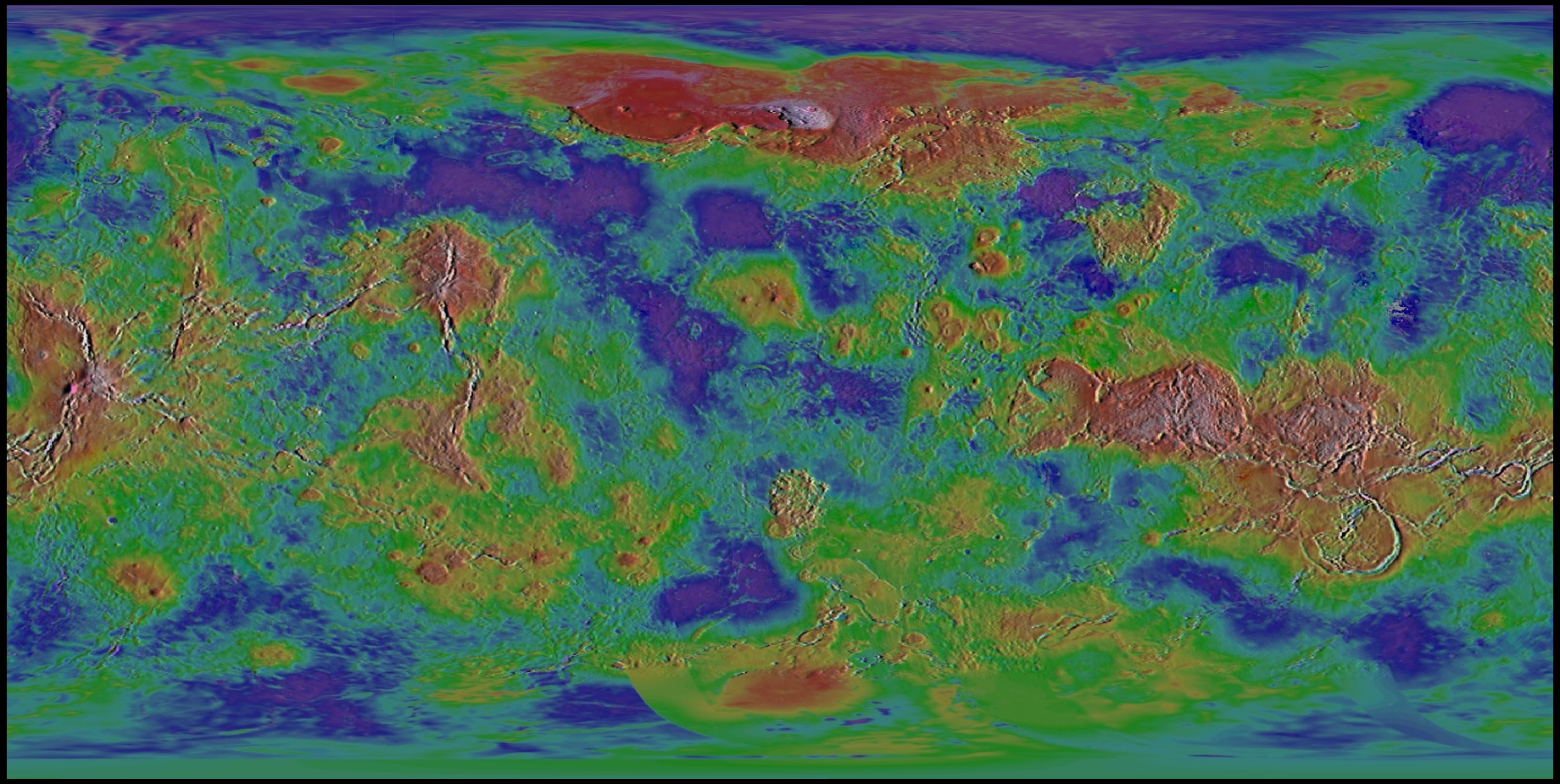
Superficie de Venus

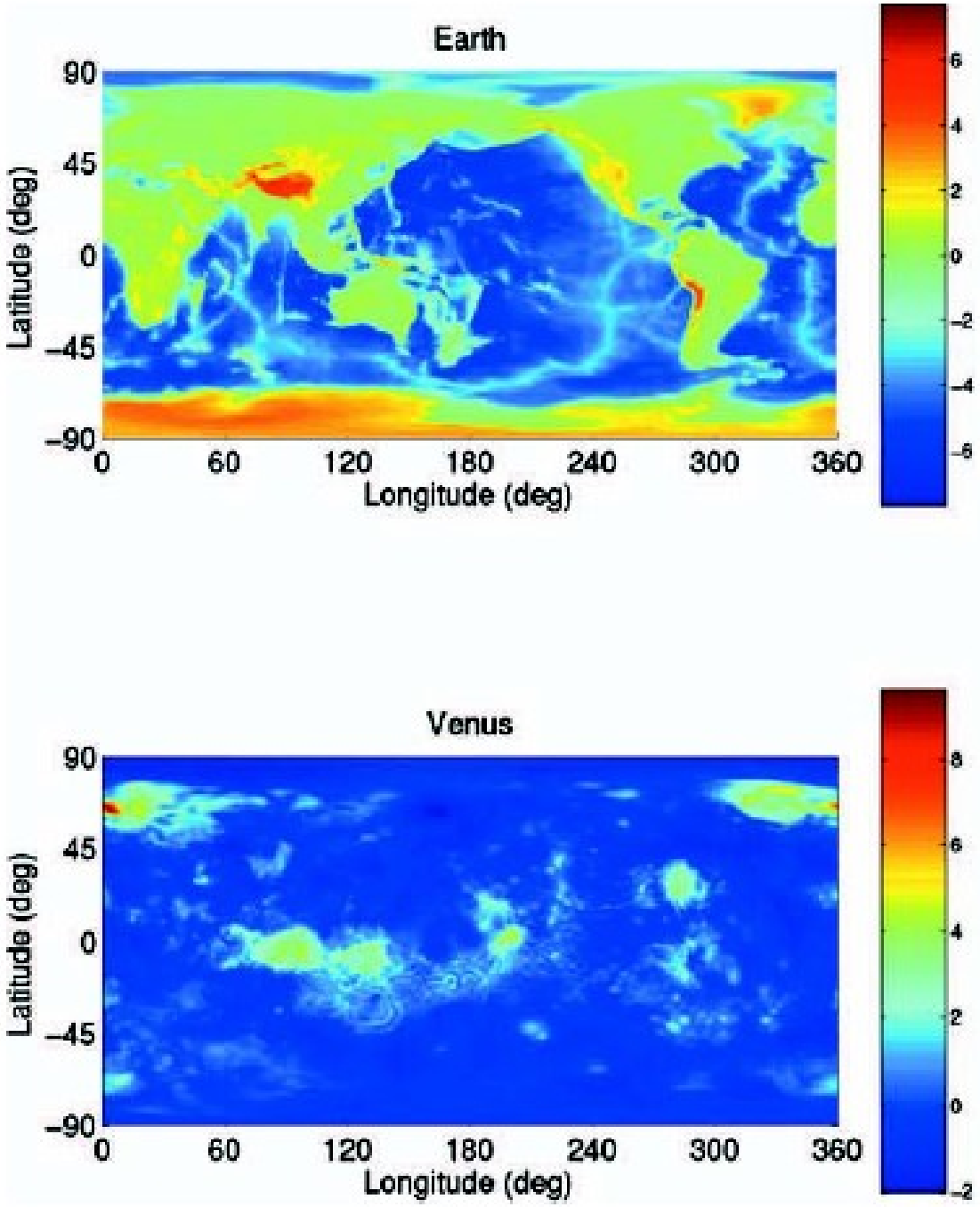
Venera 14 (1982)



- Condiciones en superficie: T=477ºC, P=90 atm
- Ausencia de H_2O → escasa erosión

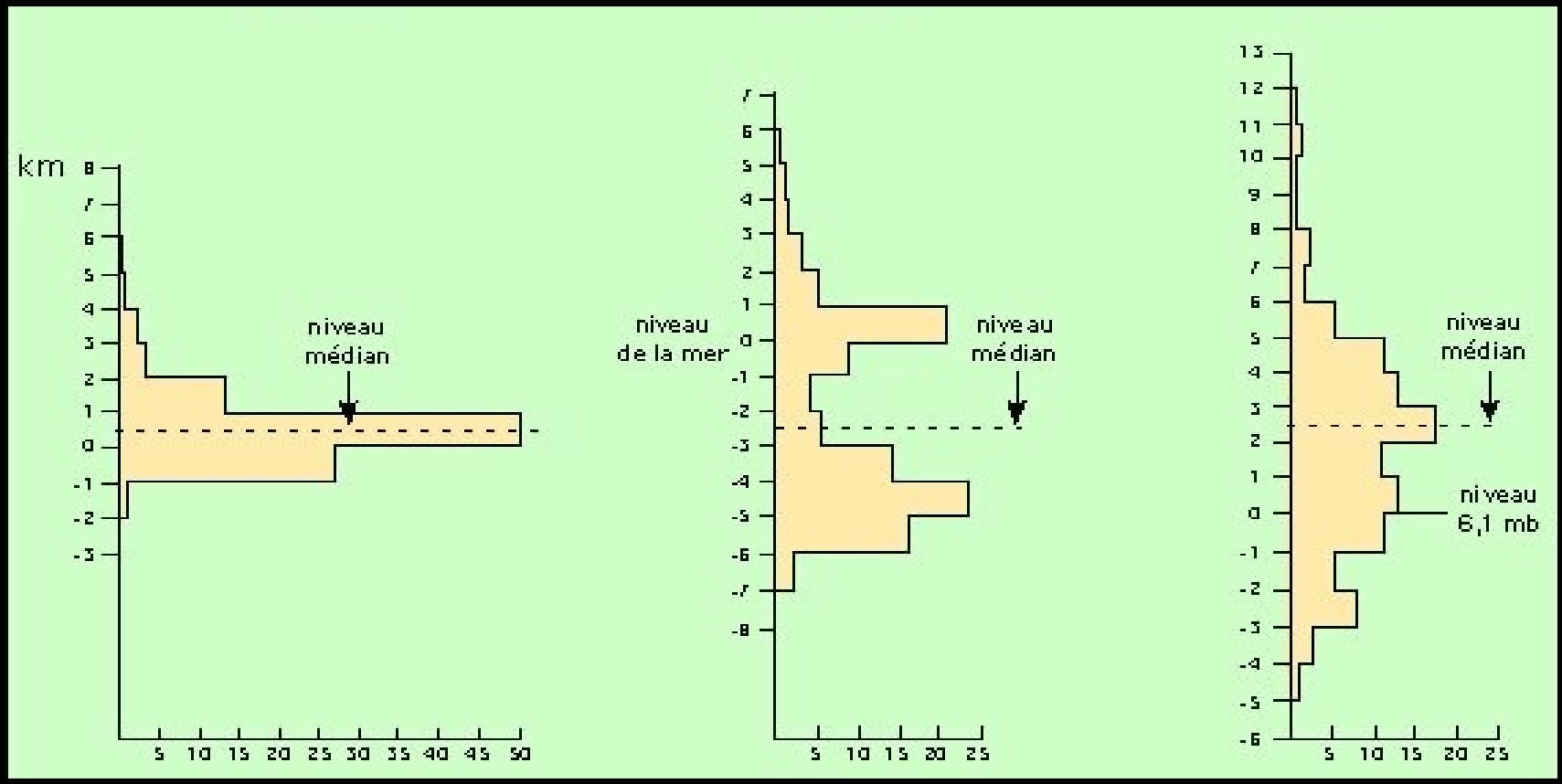
Topografía de Venus



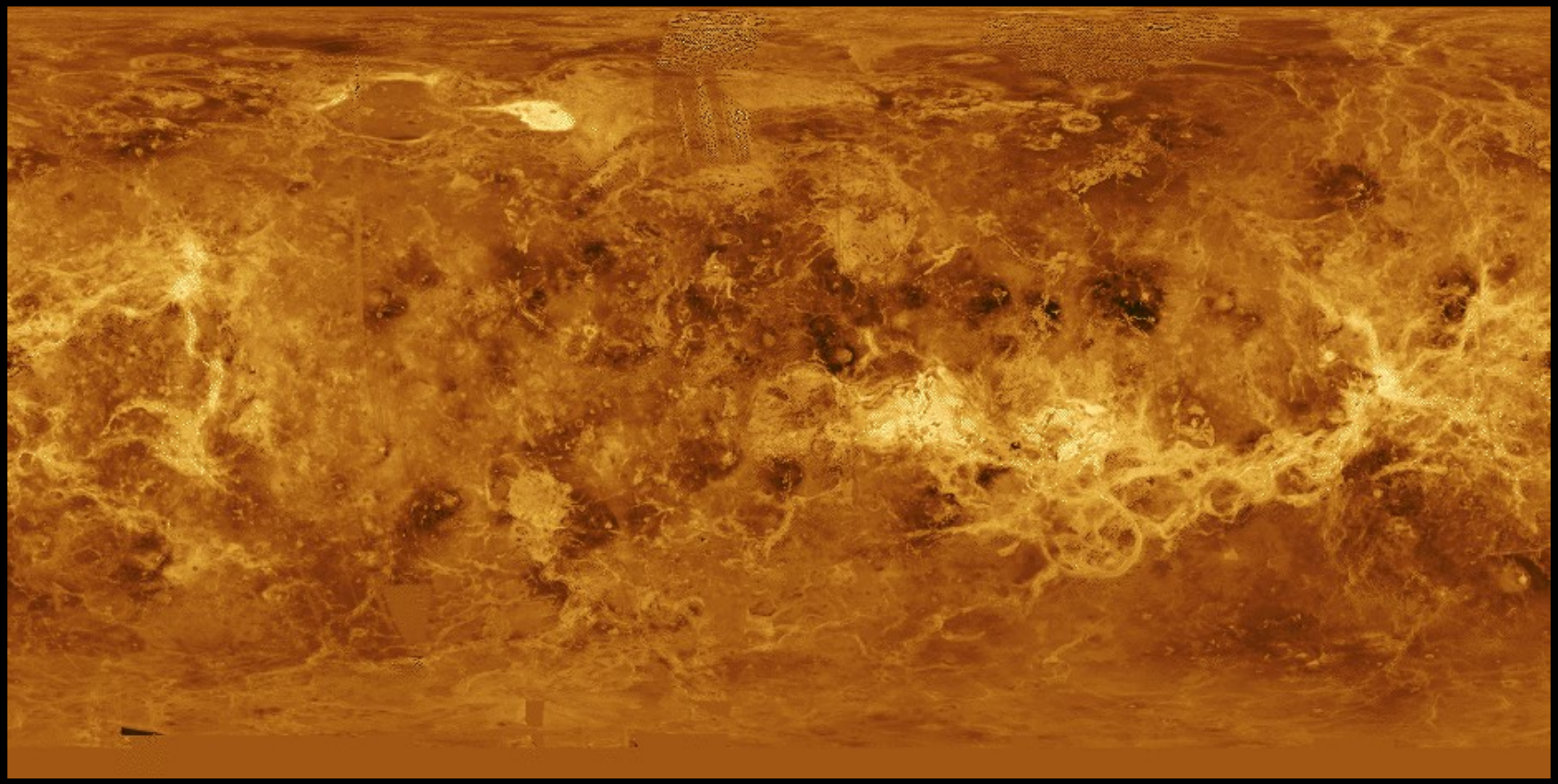

Earth
90
45
0
−45
−90
Latitude (deg)
0
60
120
180
240
300
360
Longitude (deg)
6
4
2
0
−2
−4
−6
Venus
90
45
0
−45
−90
Latitude (deg)
0
60
120
180
240
300
360
Longitude (deg)
8
6
4
2
0
−2

Hipsometría

Venus **La Tierra** **Marte**



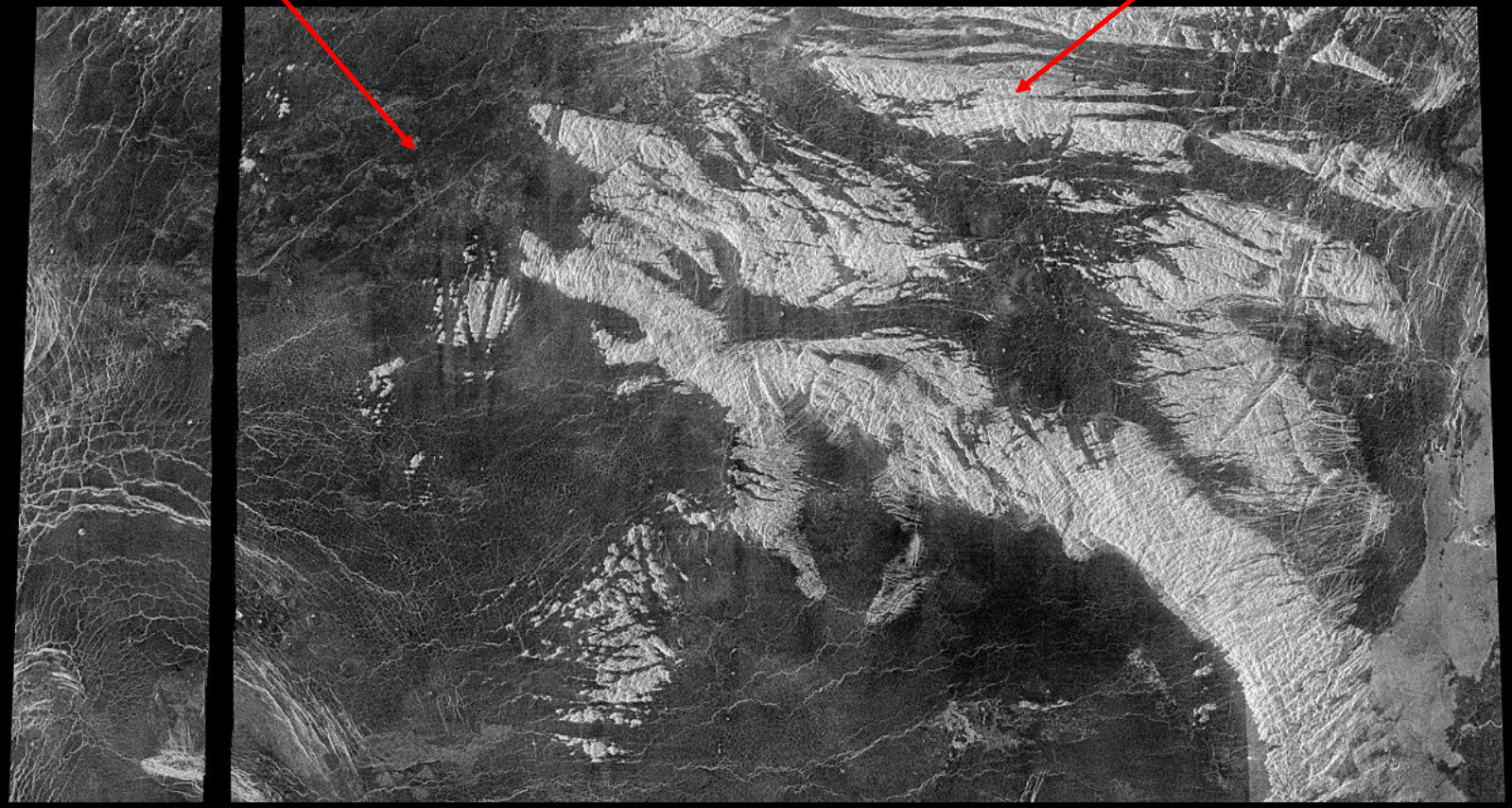
Mapa de Radar de la superficie de Venus



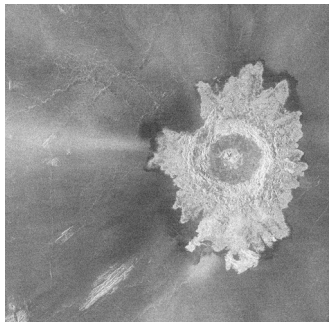
Unidades principales en Venus

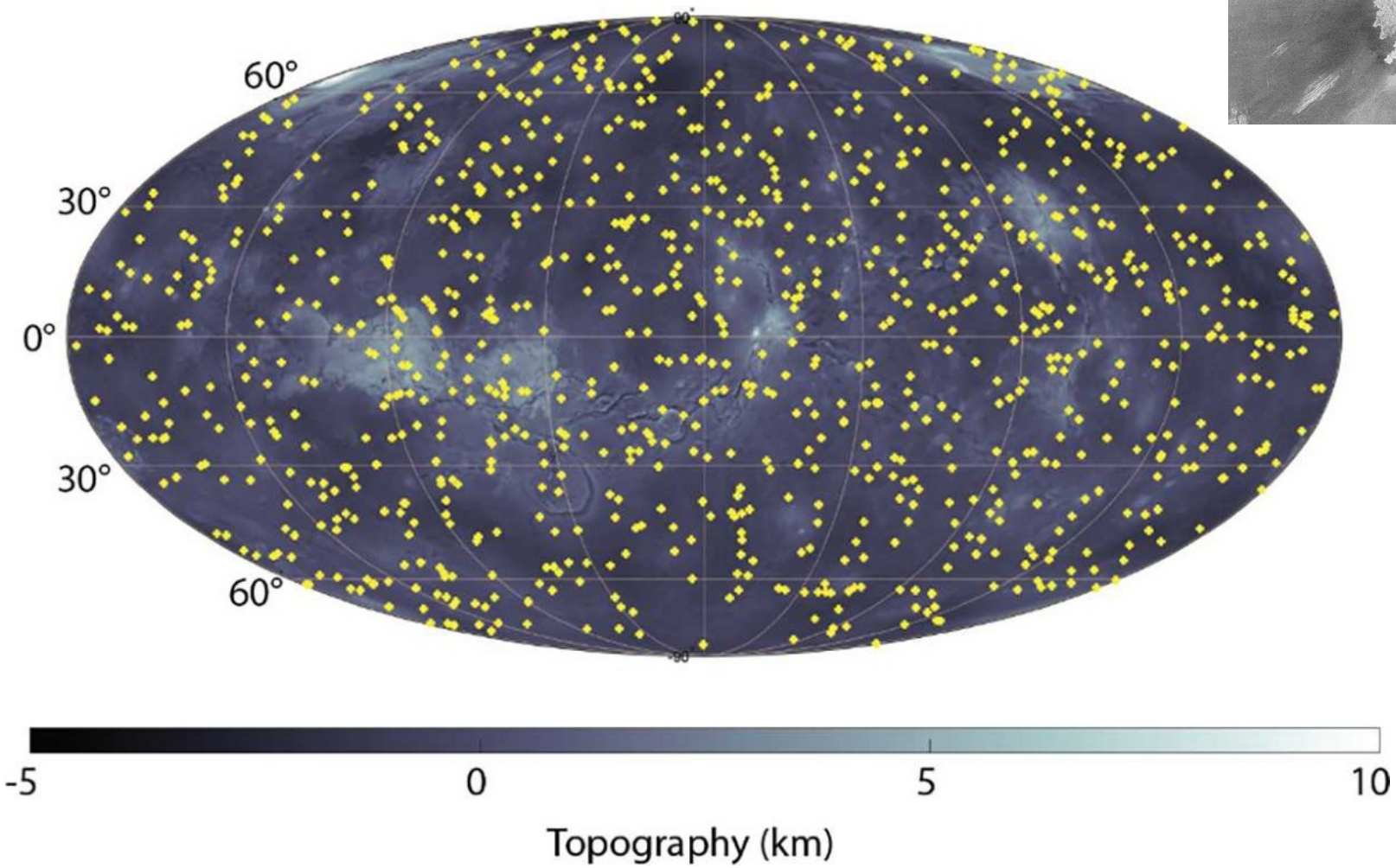
Llanuras volcánicas

Tesseras

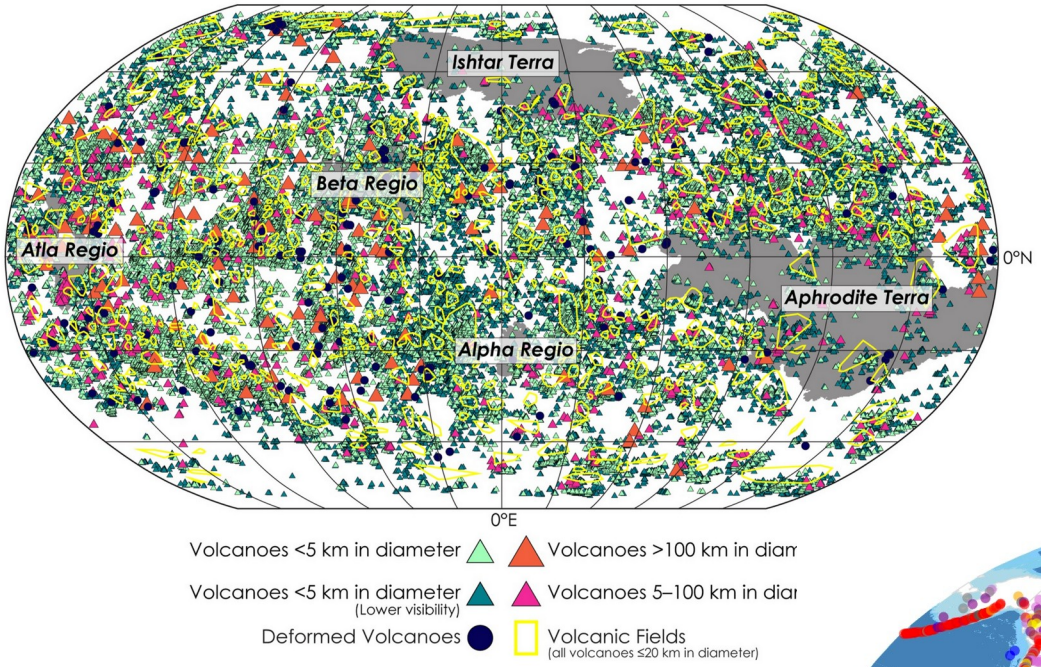


Distribución espacial de los cráteres de impacto



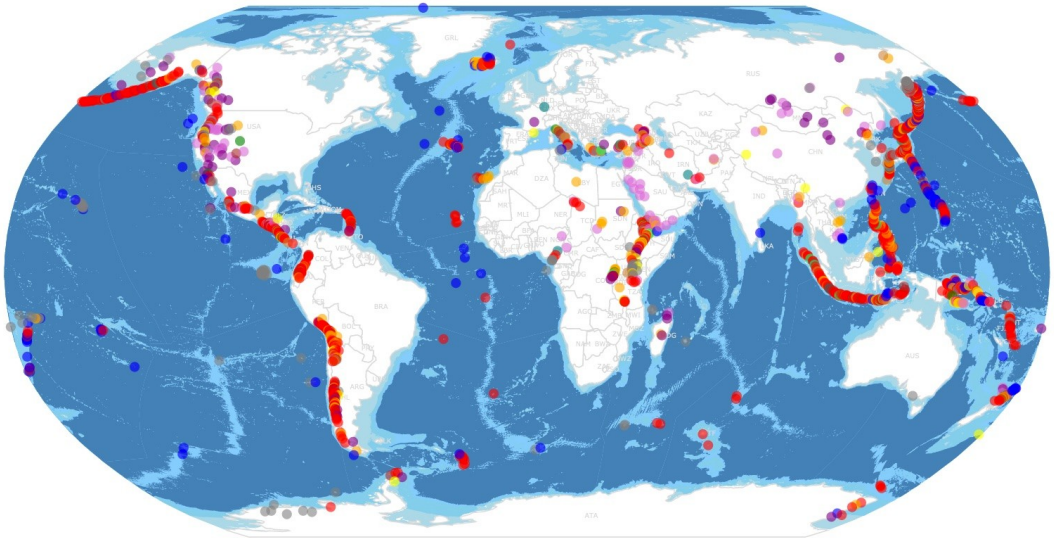


Edad mediante contaje de cráteres entre 300-1000 Ma



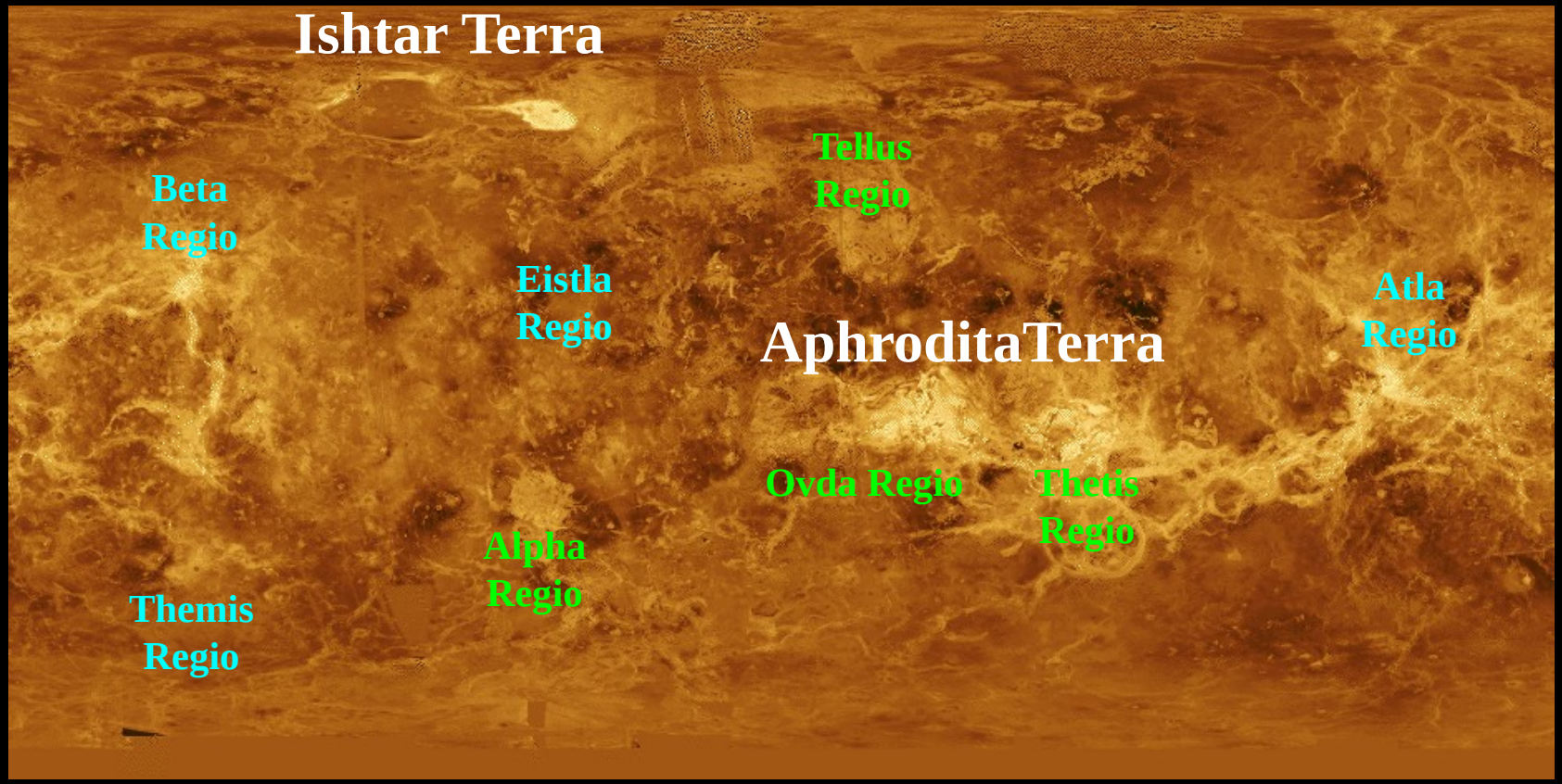
Volcanes en Venus

Volcanes en la tierra

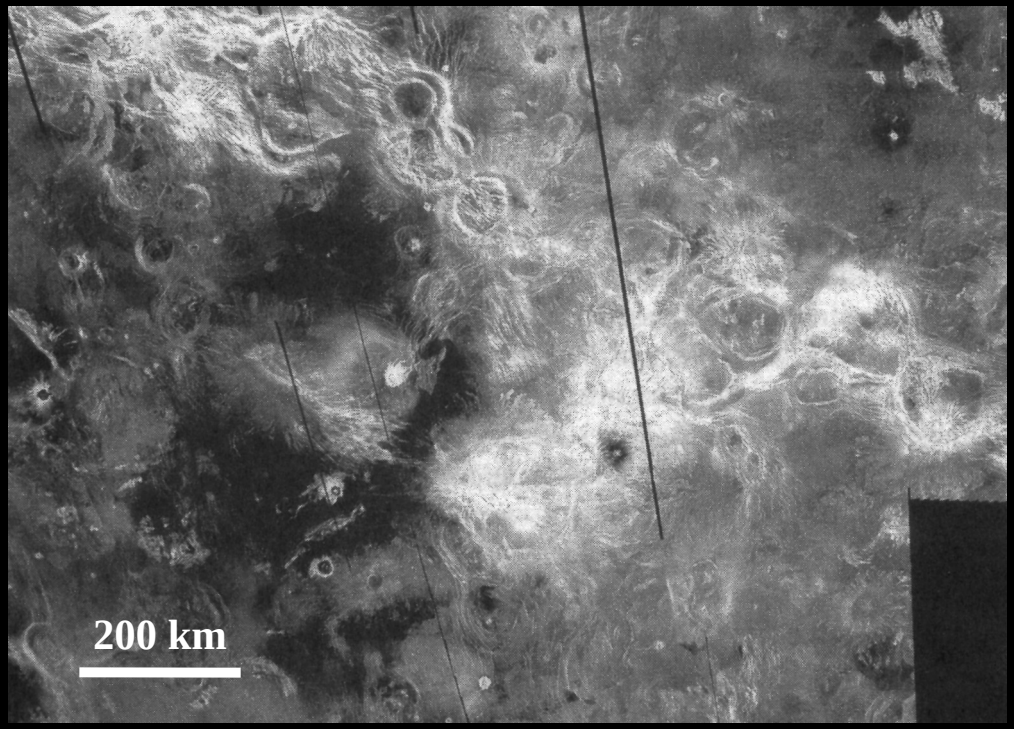


Volcano Types in this Map			
Shield Volcano	Strato Volcano	Caldera	Cinder Cone
Pyroclast	Explosion	Complex volcano	Lava
Maars	Fumarole	Submarine	Volcanic
Other			

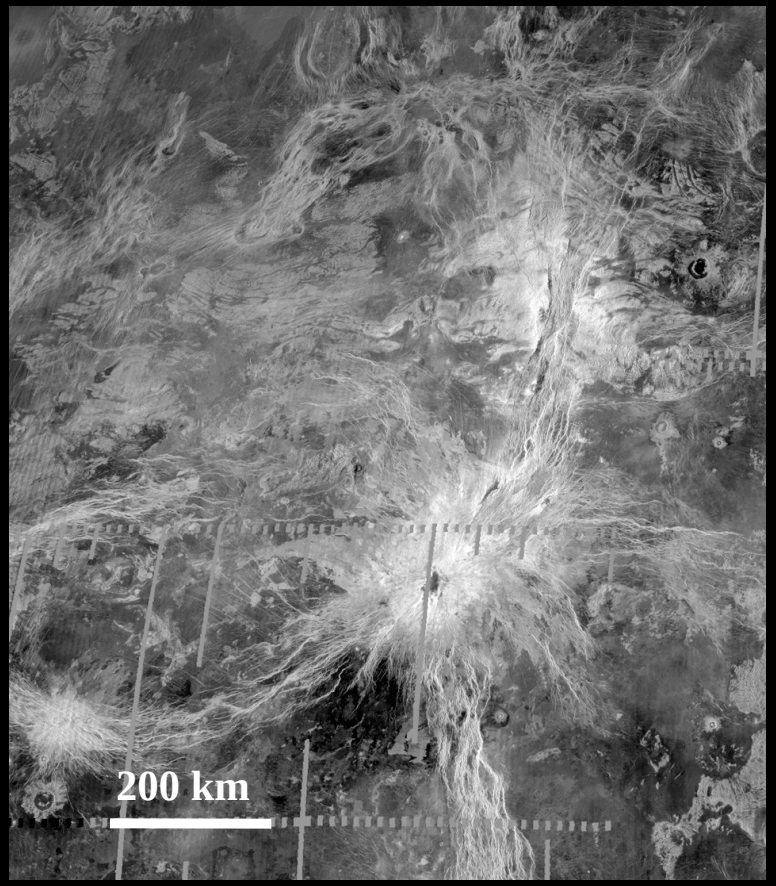
Mapa de Radar de la superficie de Venus



Elevaciones de origen volcánico unidas por rifts

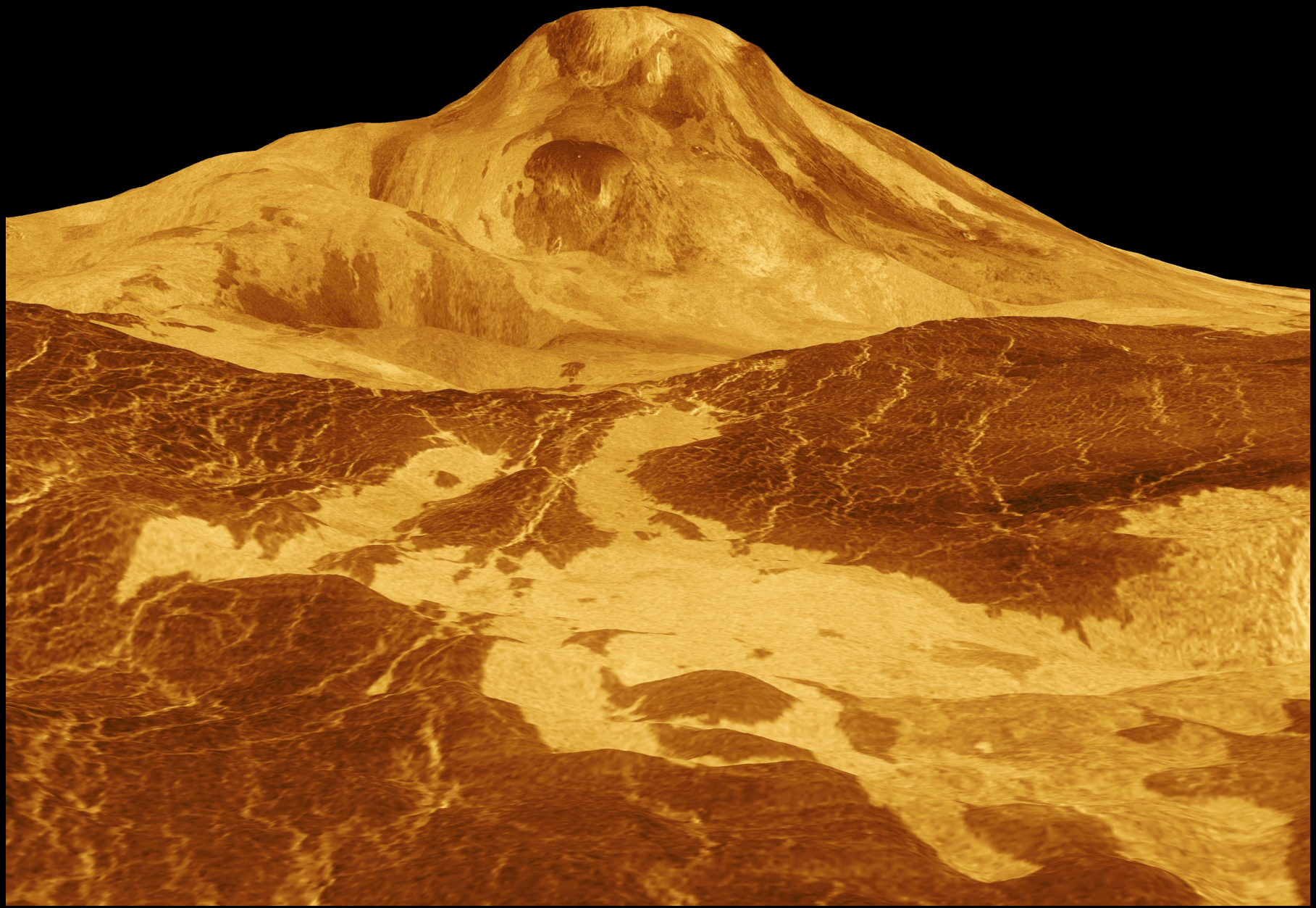


Themis Regio

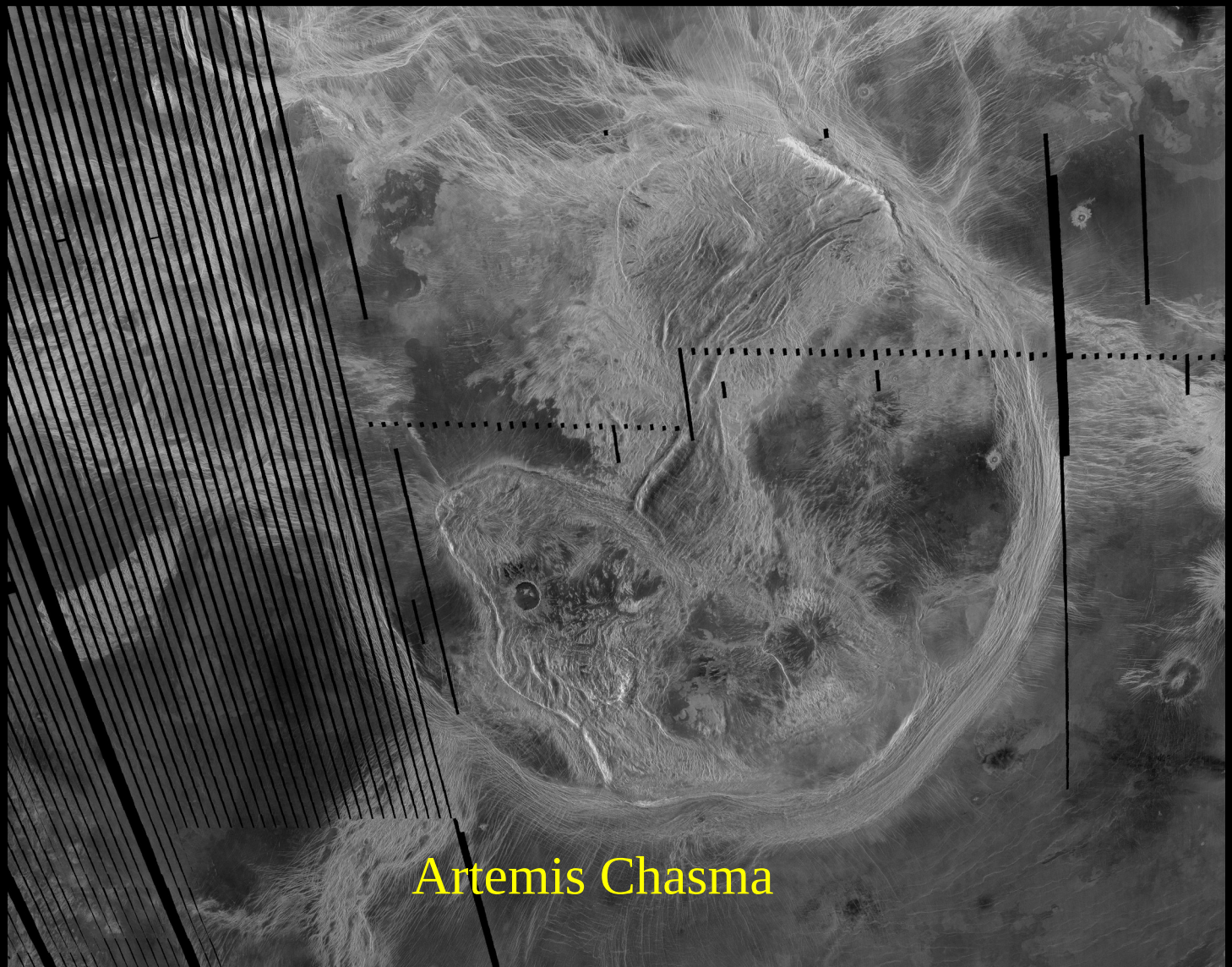


Beta Regio

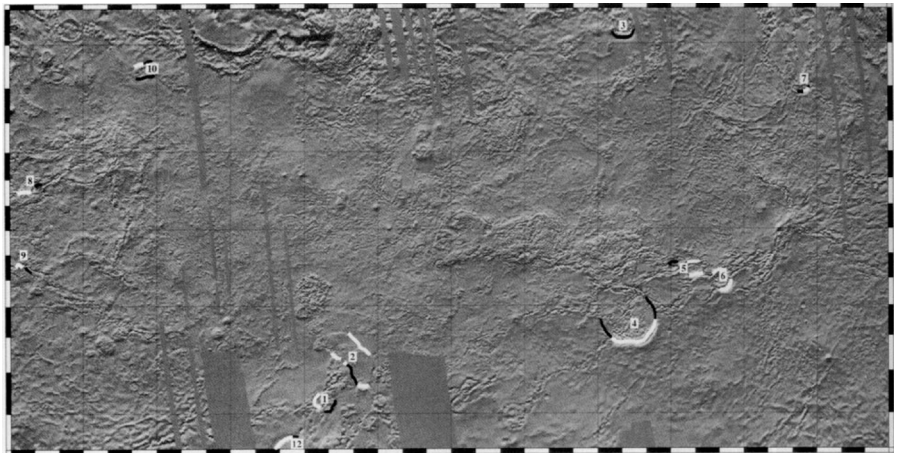
Maat mons

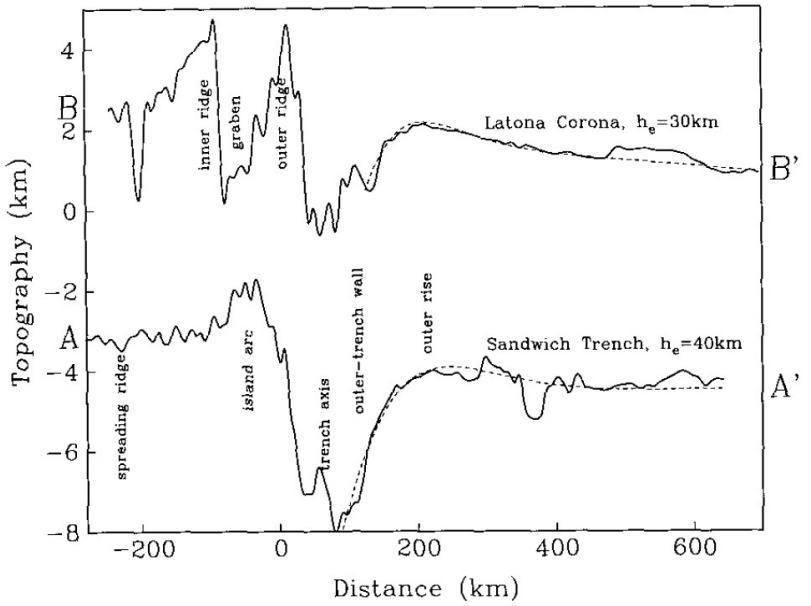


¿Zonas de subducción similares a arcos isla?

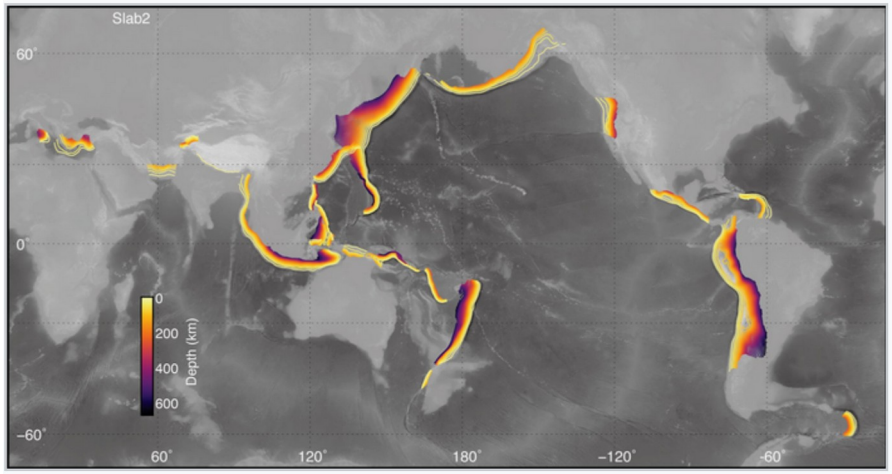


¿Hay zonas de subducción similares a arcos isla?

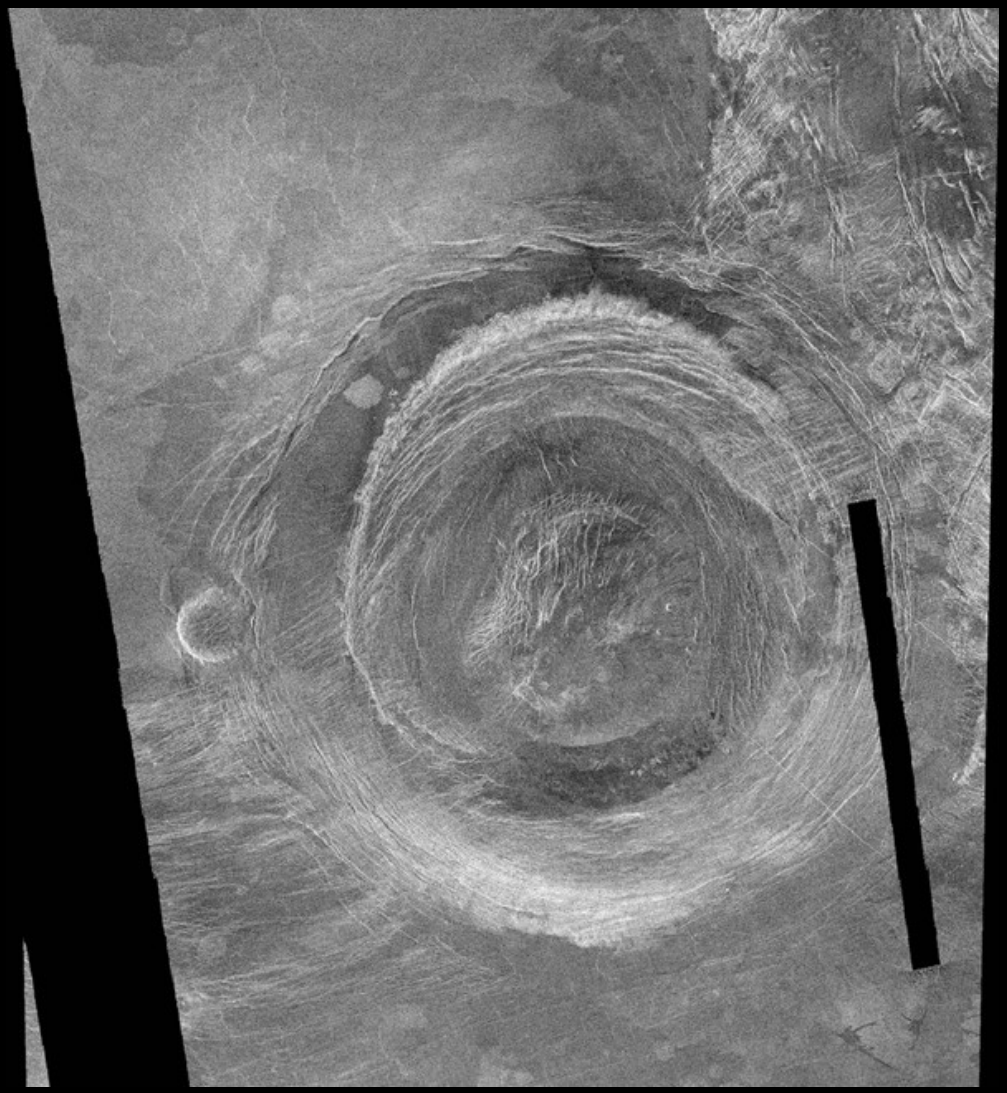




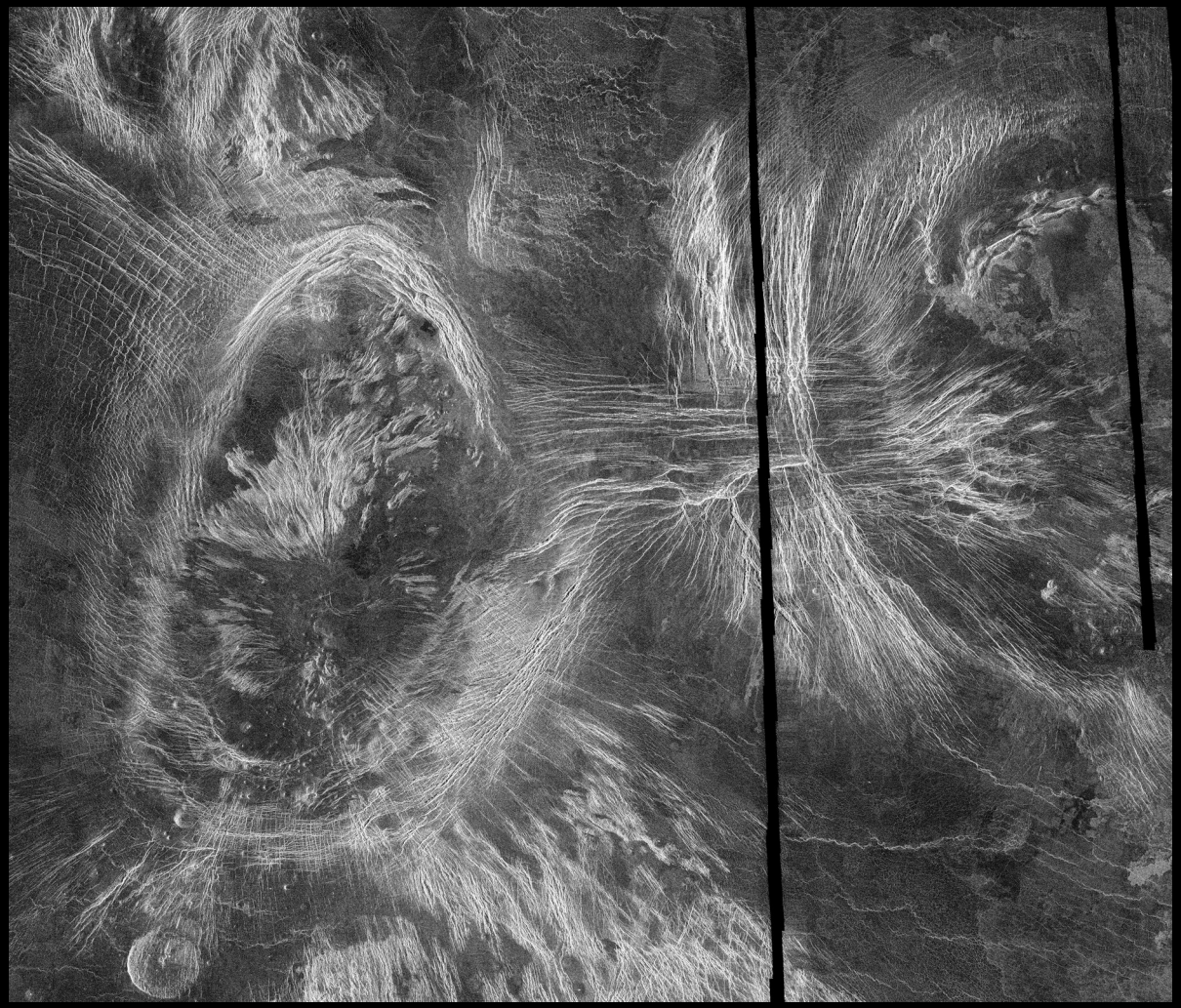
Schubert & Sandwell (1995)



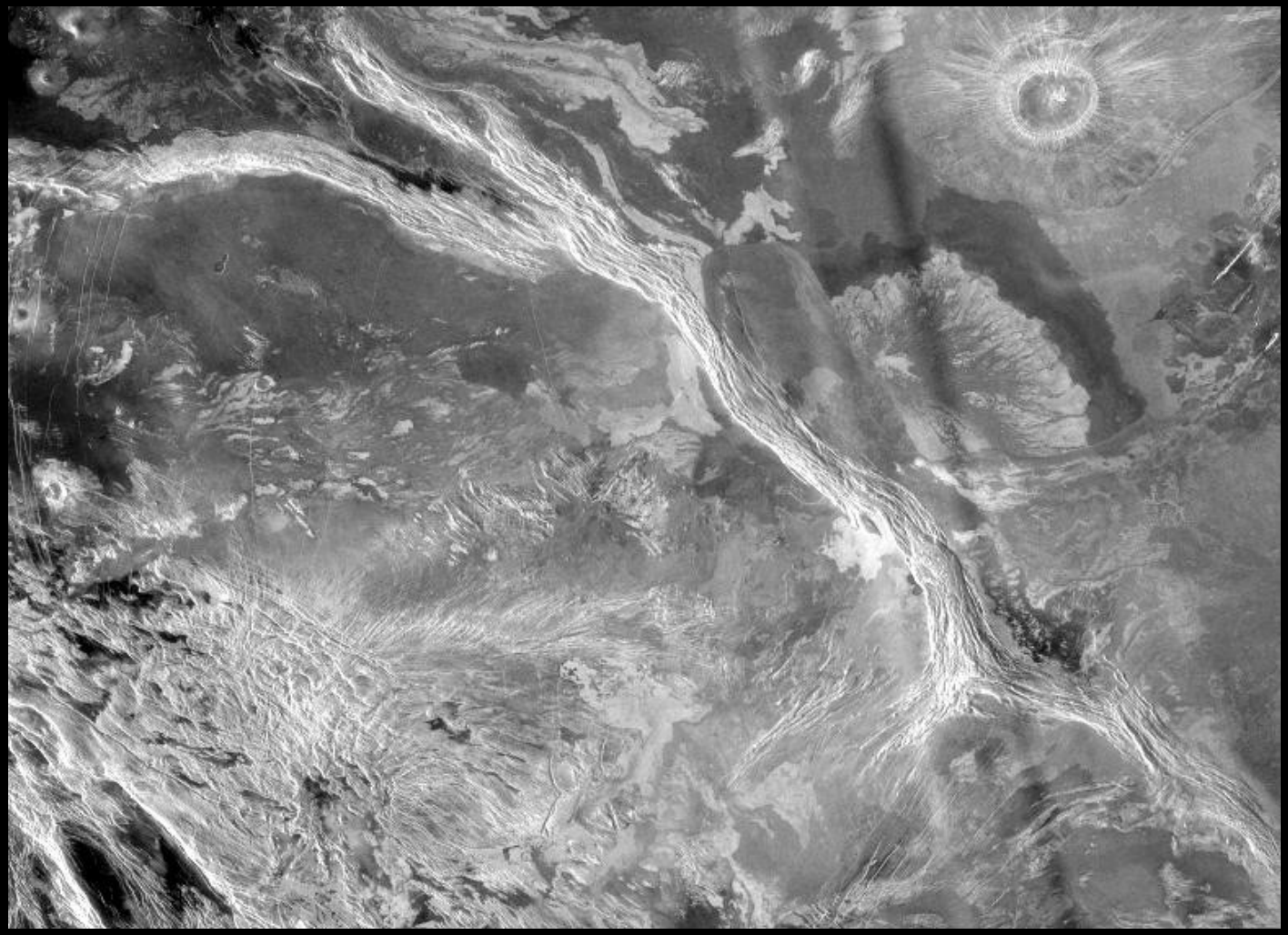
Tectónica en las llanuras volcánicas: Coronas



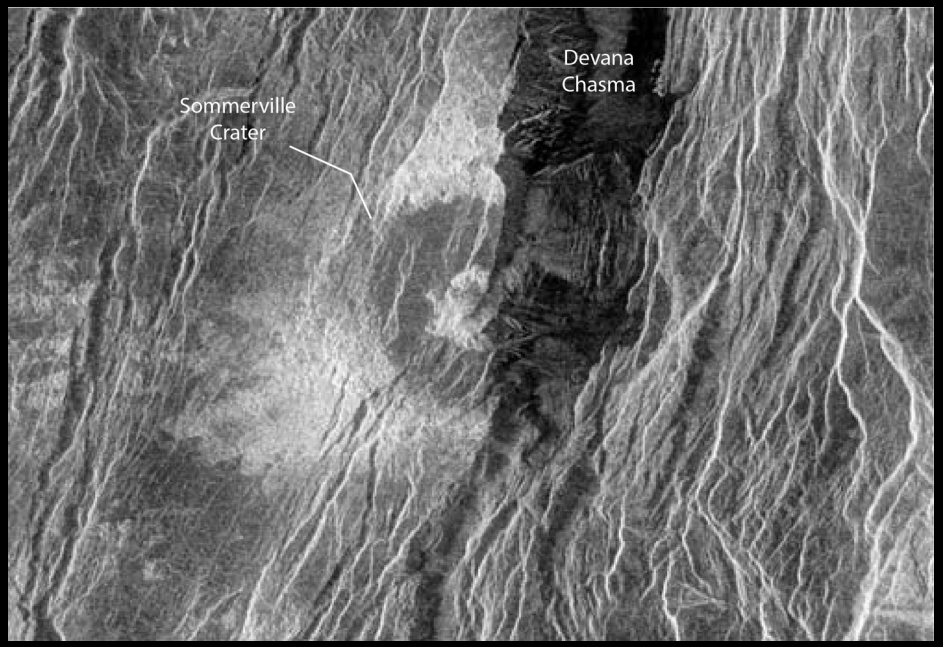
Tectónica en las llanuras volcánicas: Coronas

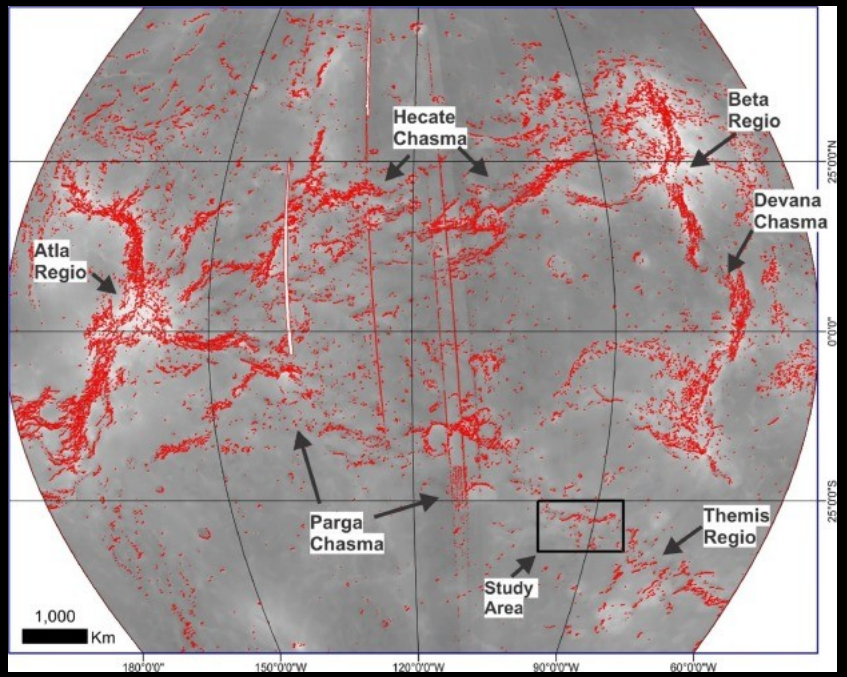


Tectónica en las llanuras volcánicas: Cinturones compresivos

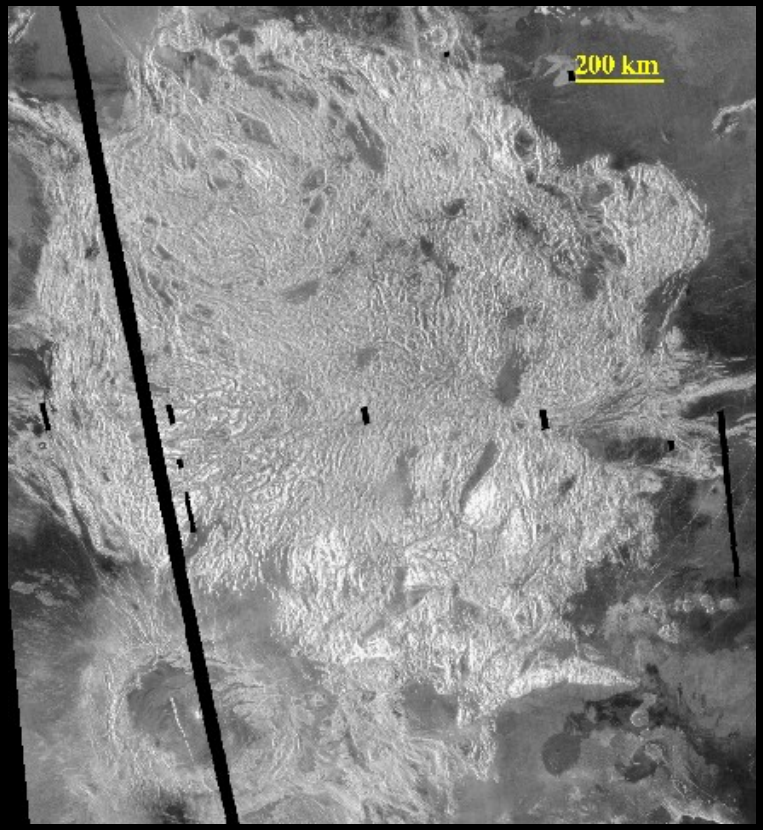


Tectónica en las llanuras volcánicas: Rifts

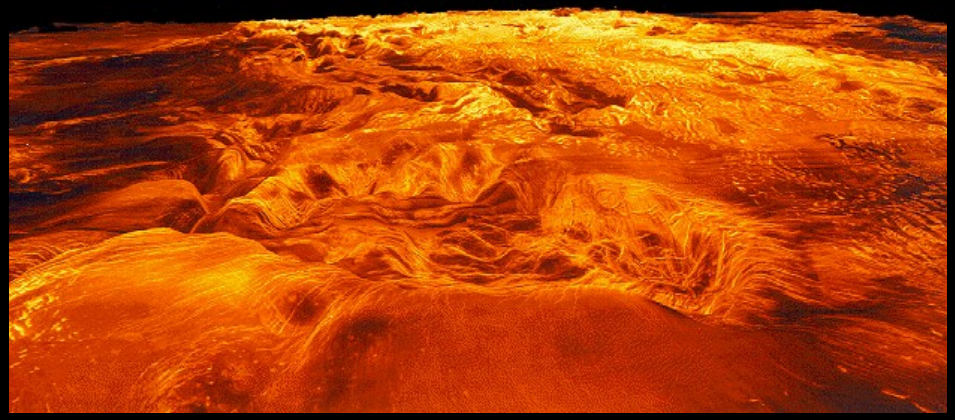




Plateaus Corticales



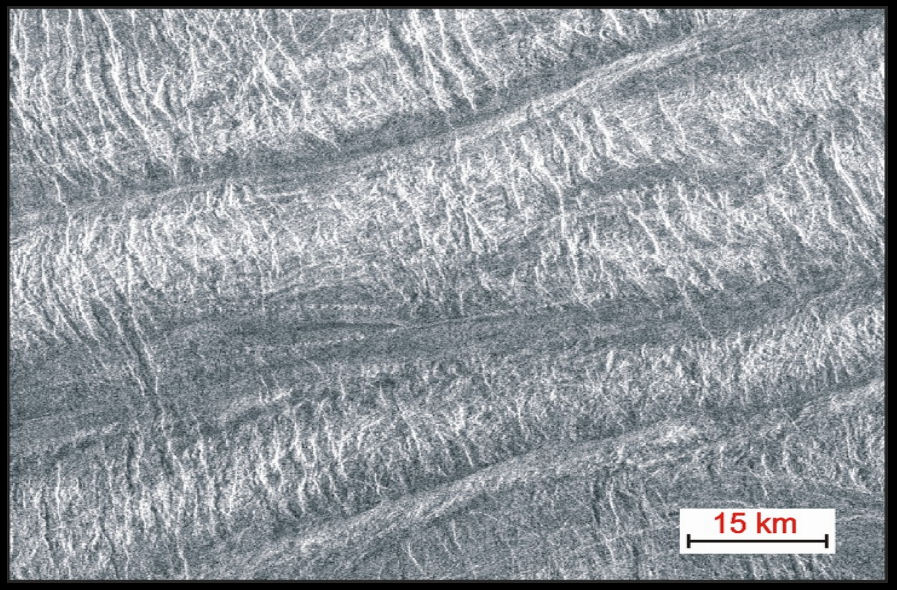
Alpha regio



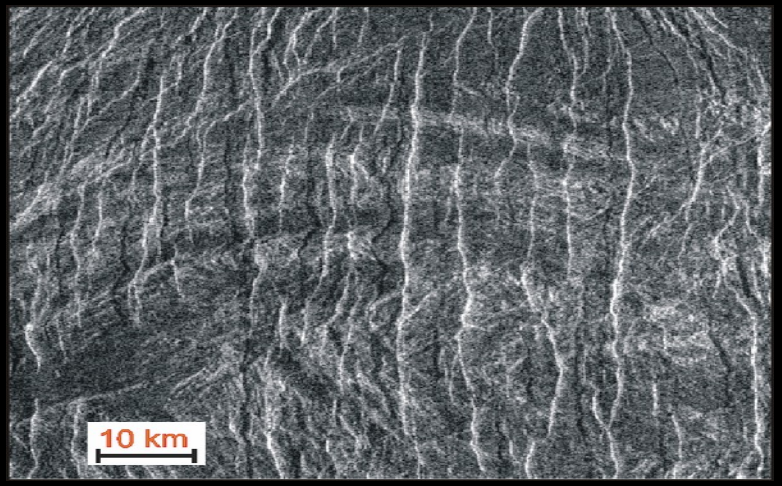
Ovda regio

¿Cómo se han formado?

Estructuras tectónicas en terrenos de tesseras



Pliegues



Graben

Modelos clásicos de formación de plateaus corticales

Mantle downwelling flow

Engrosamiento tectónico

1° pliegues

2° graben

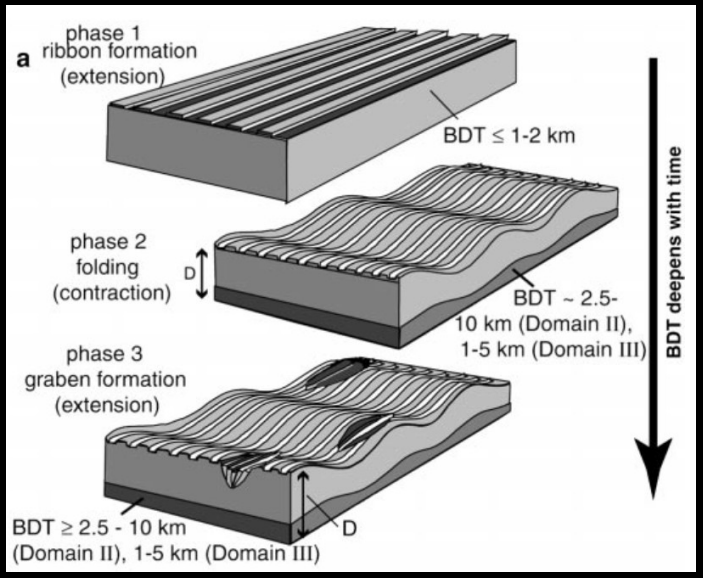
Mantle upwelling flow
Plume model

Engrosamiento magmático

1° ribbon (graben finos)

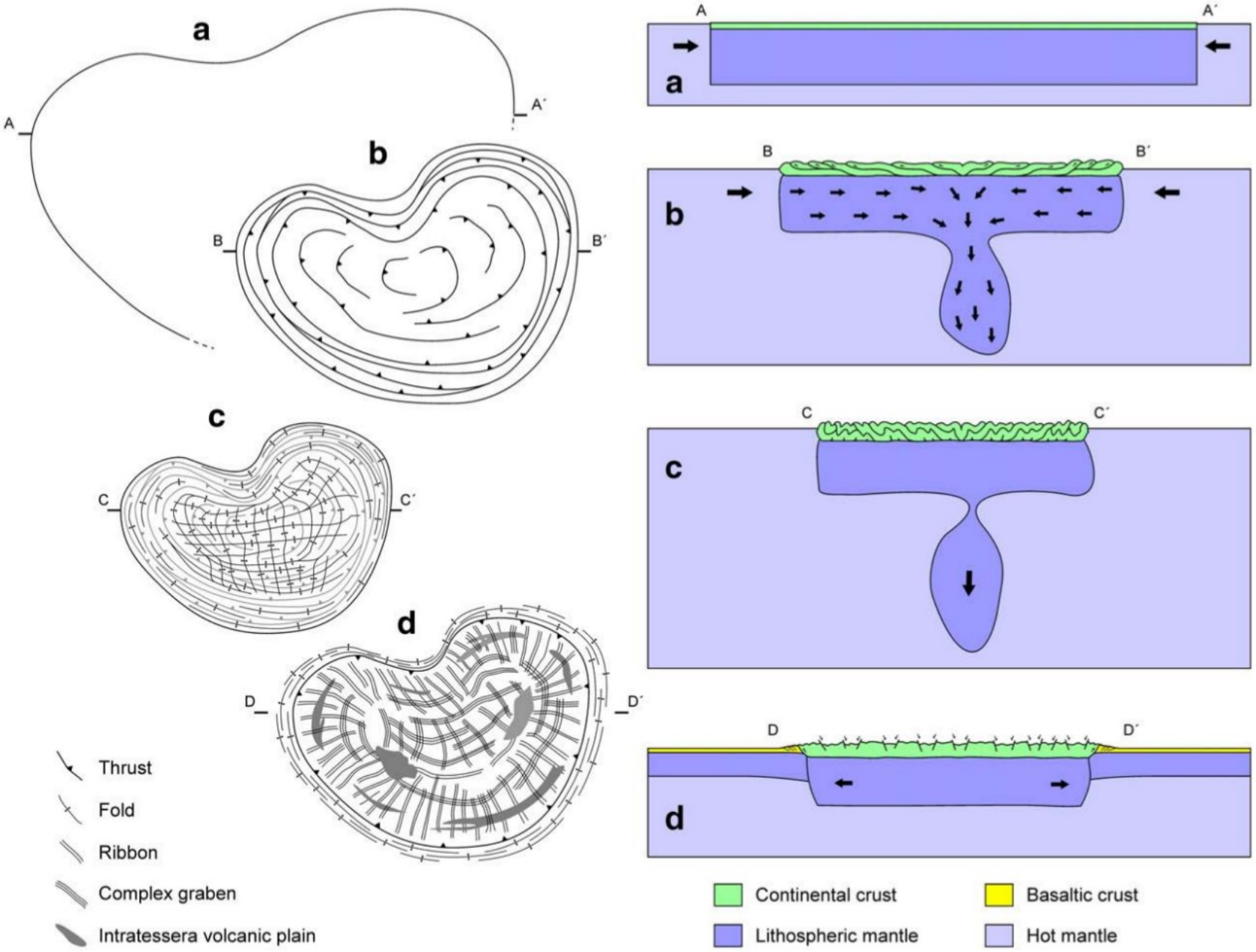
2° pliegues

3° graben



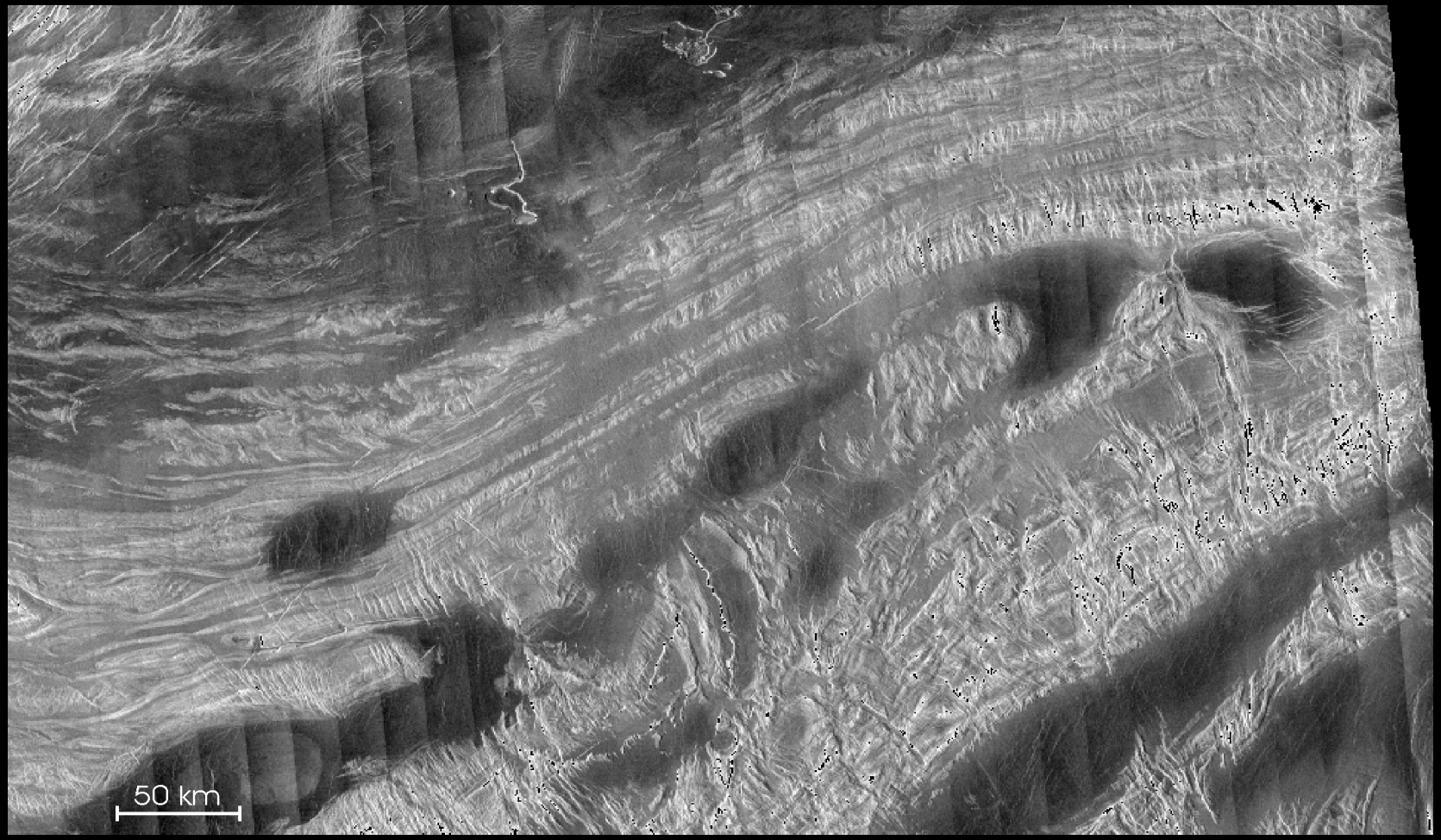
Ghent & Hansen (1999)

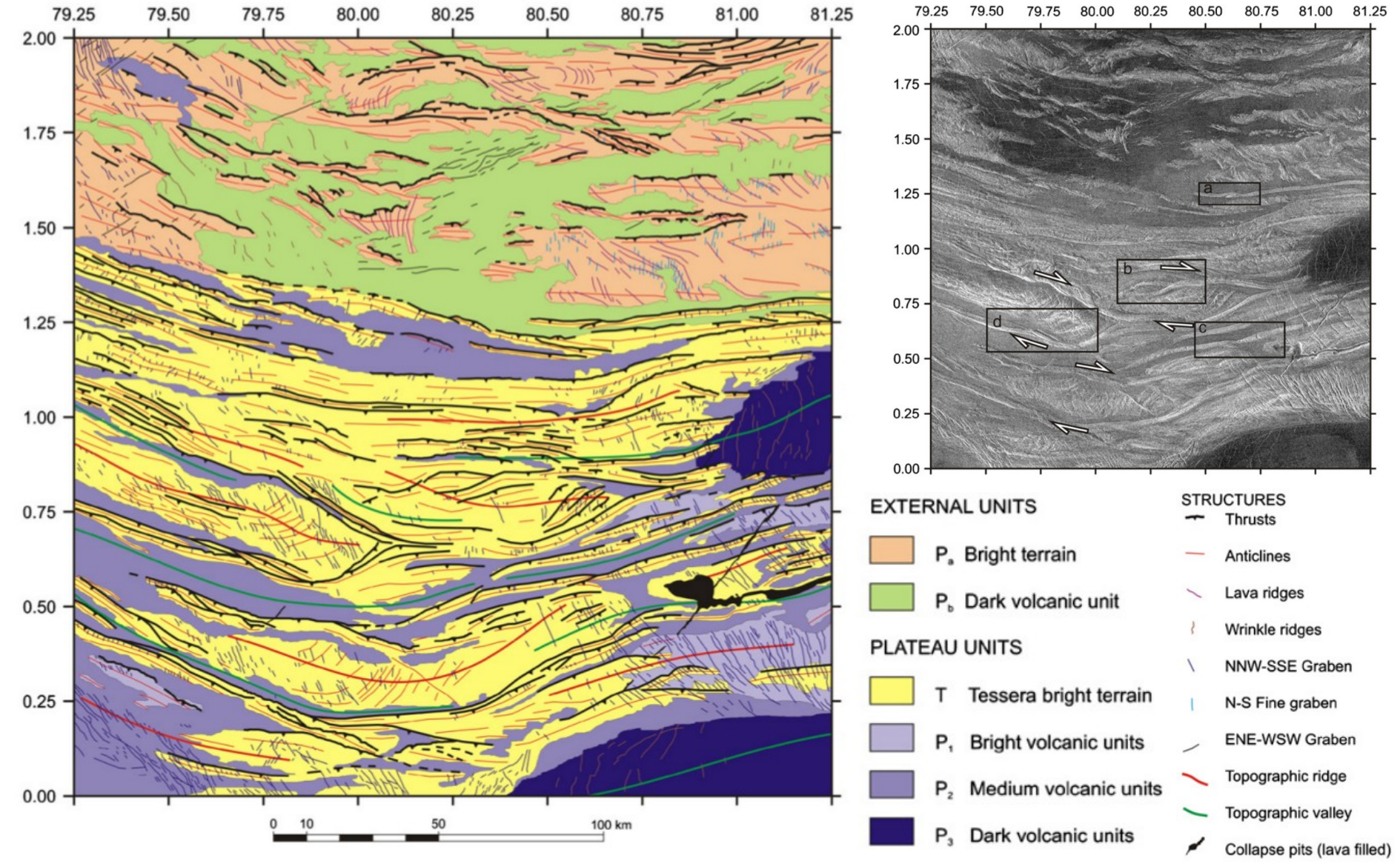
¿Y si se trata de continentes?



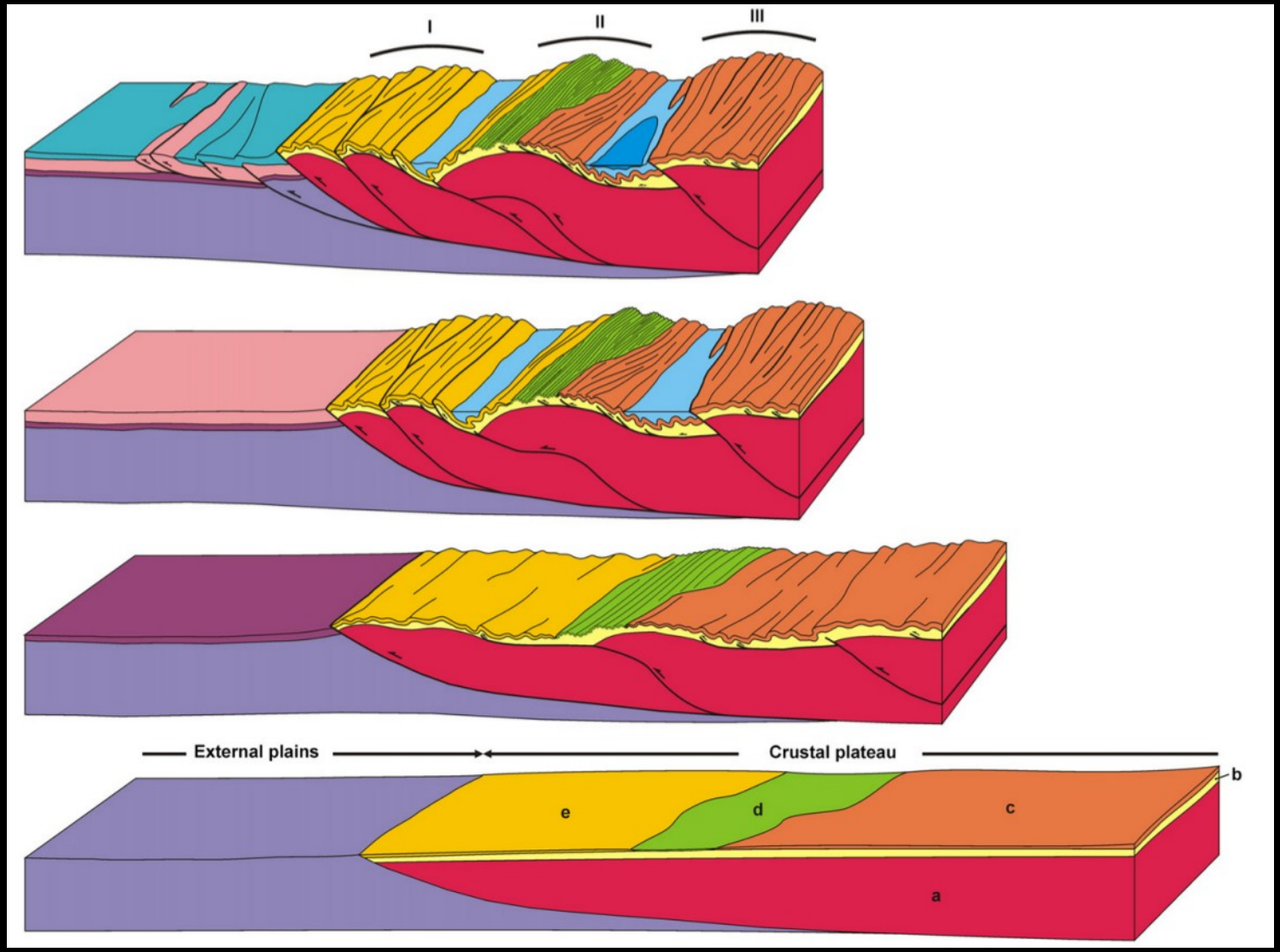
Romeo & Turcotte (2008)

Cinturón compresivo con extensión perpendicular





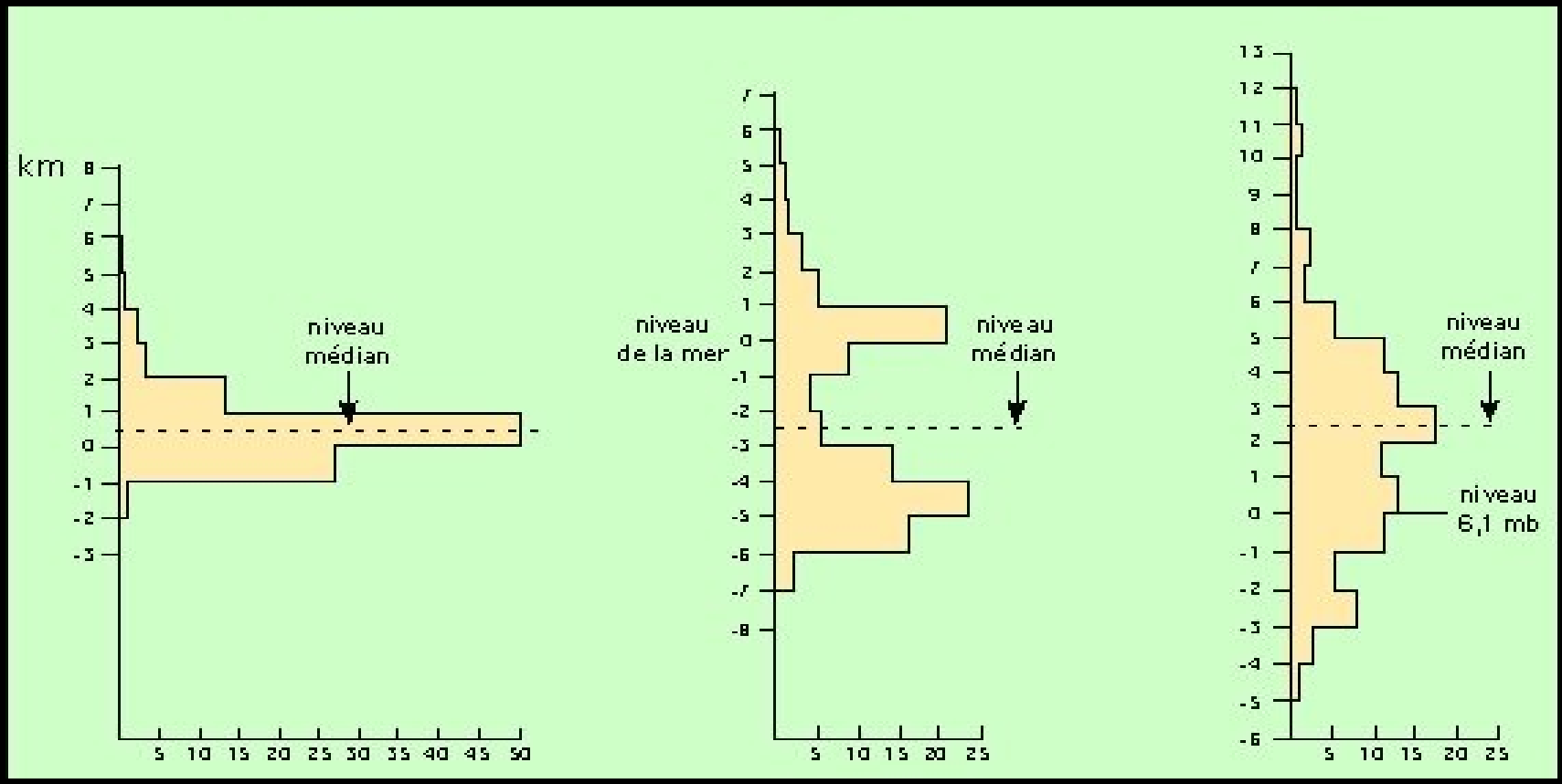
Romeo & Capote (2011)

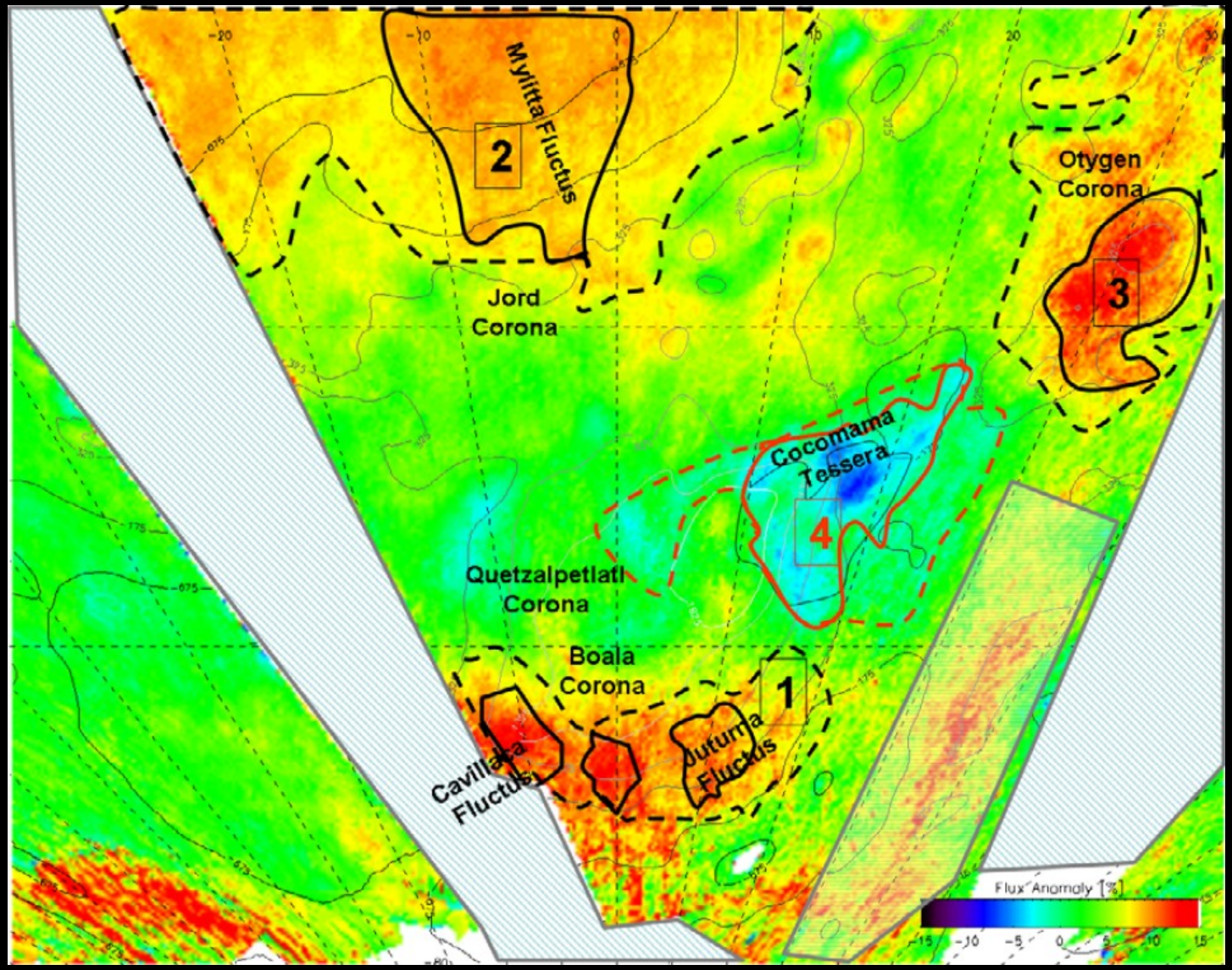


Romeo & Capote (2011)

¿Puede haber continentes en Venus?

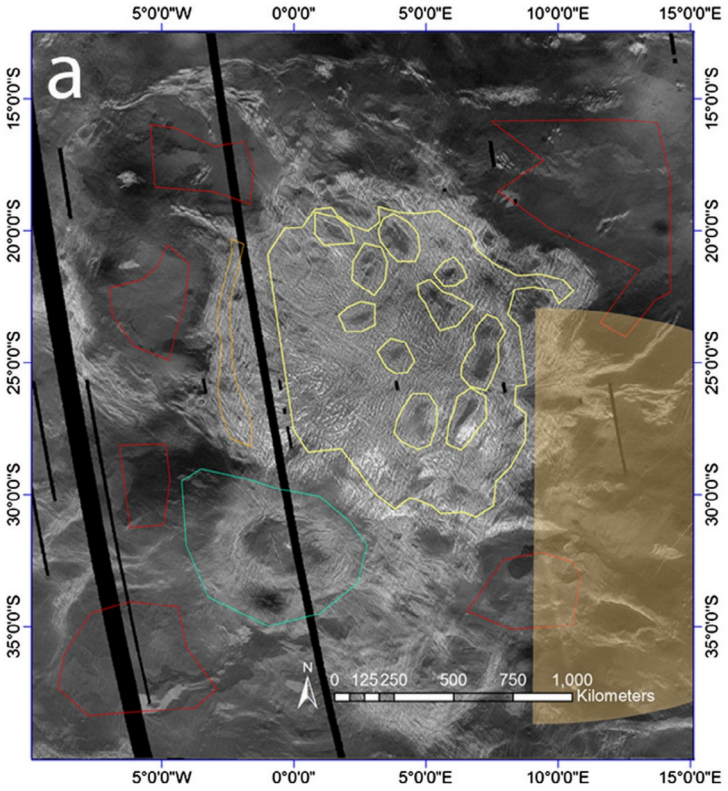
Venus **La Tierra** **Marte**

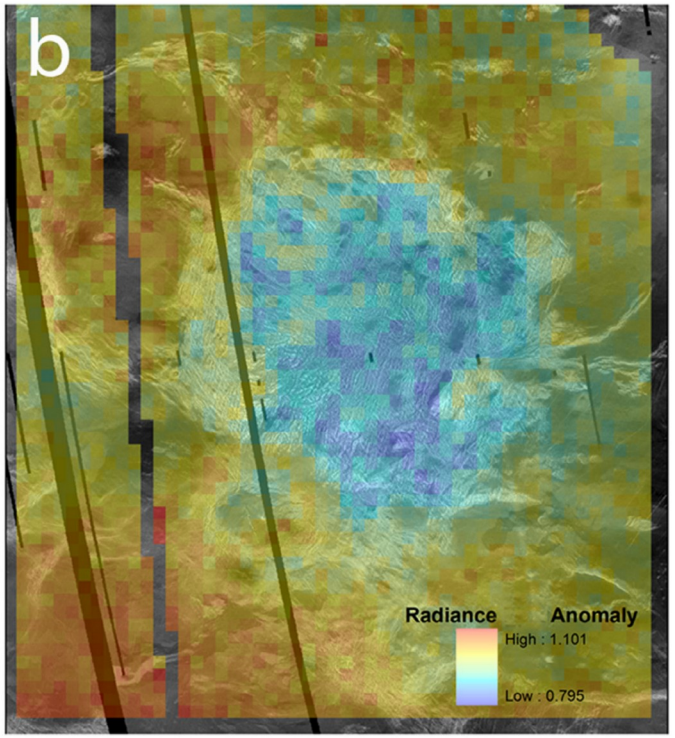


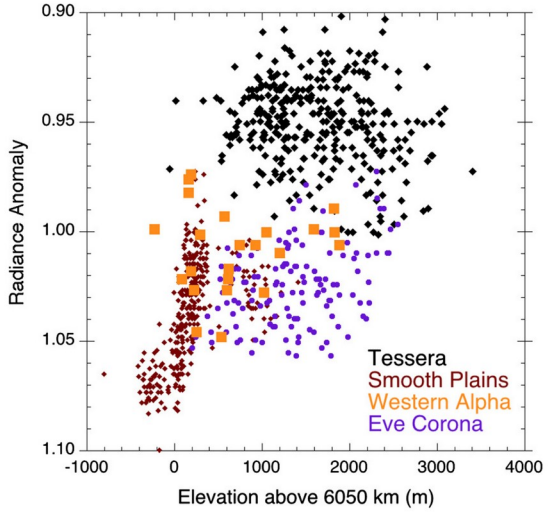


Emisividad a 1.02 µm de longitud de onda

Helbert et al. 2008







Gilmore et al. (2015)

EnVision