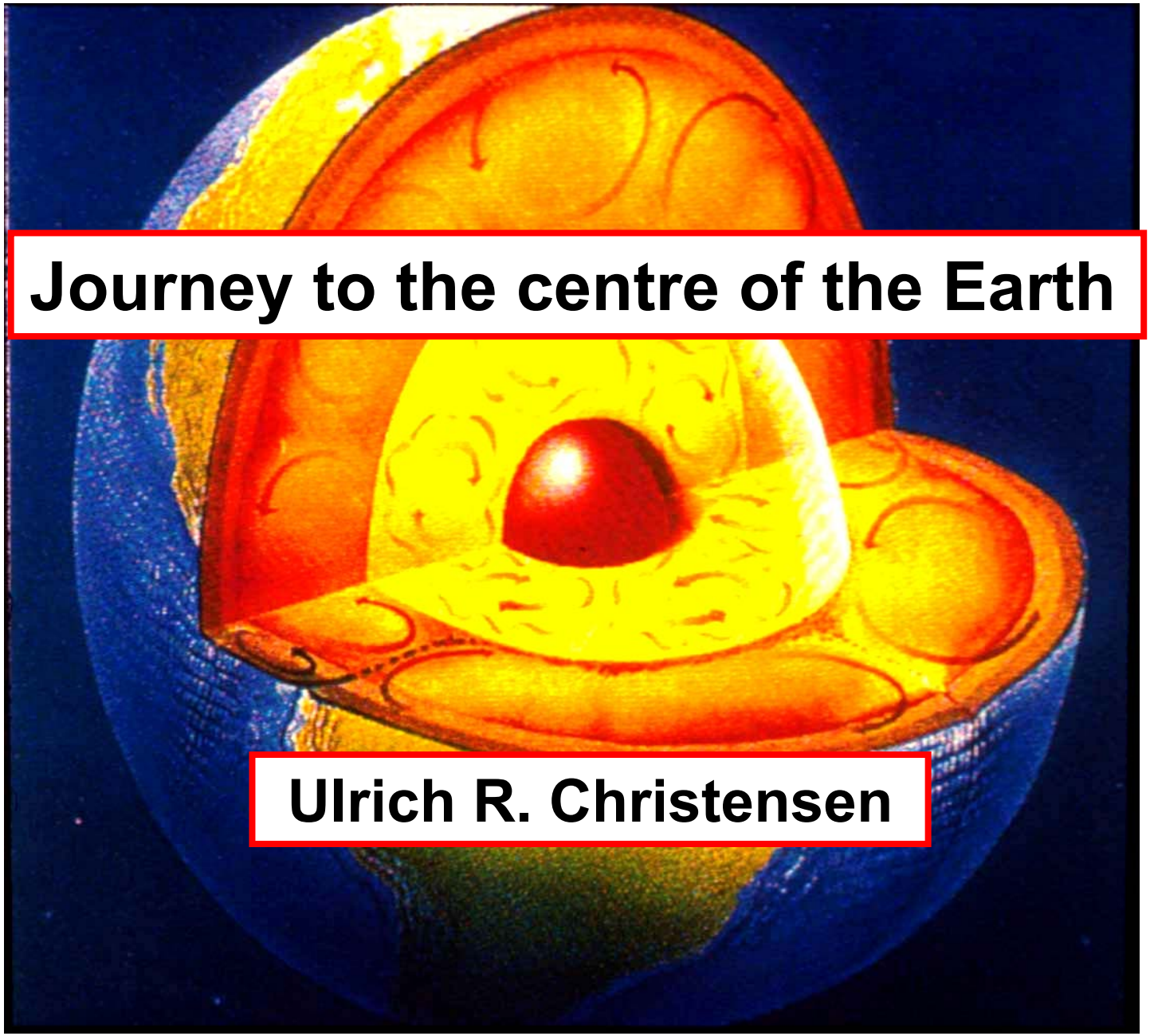
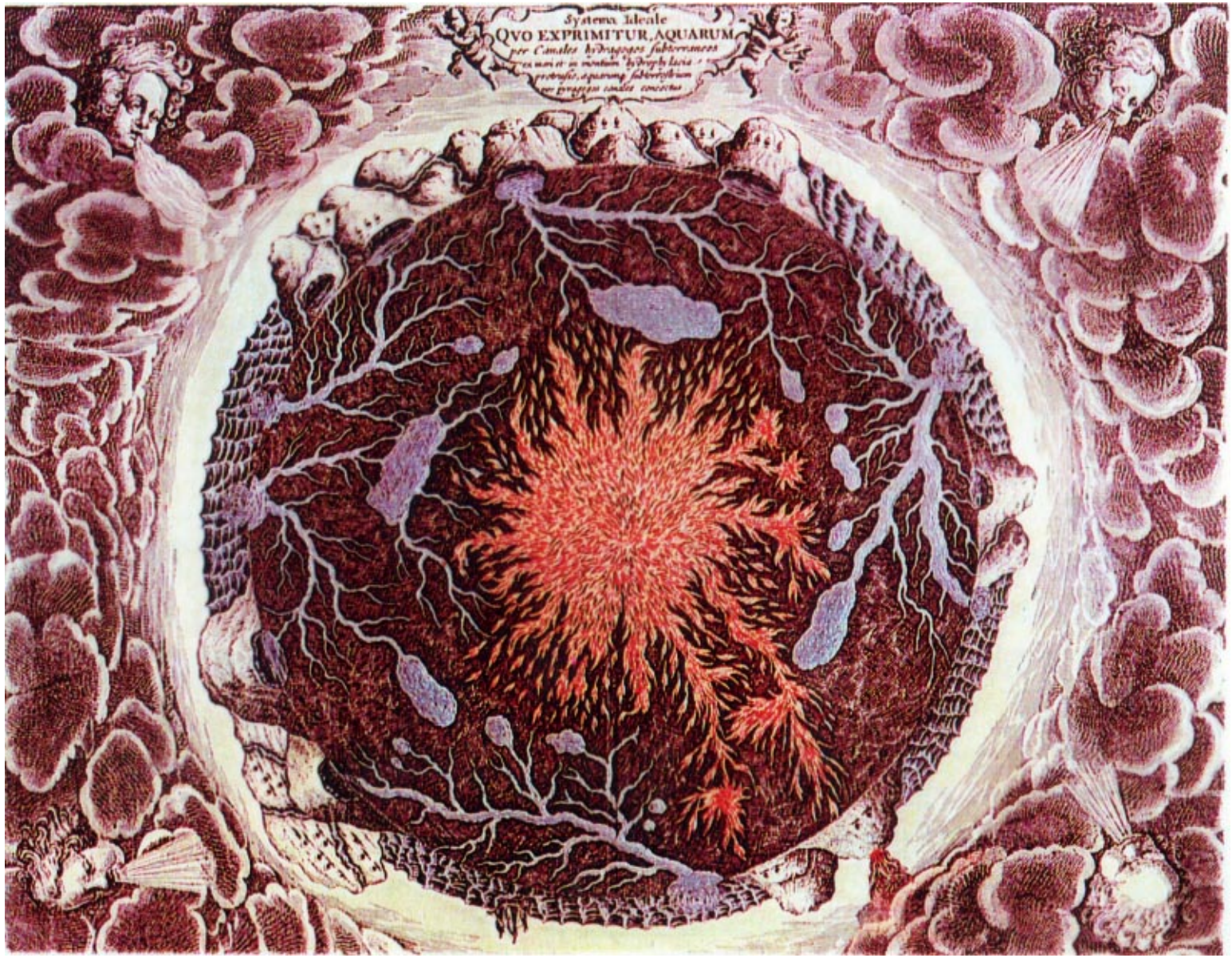


Journey to the centre of the Earth

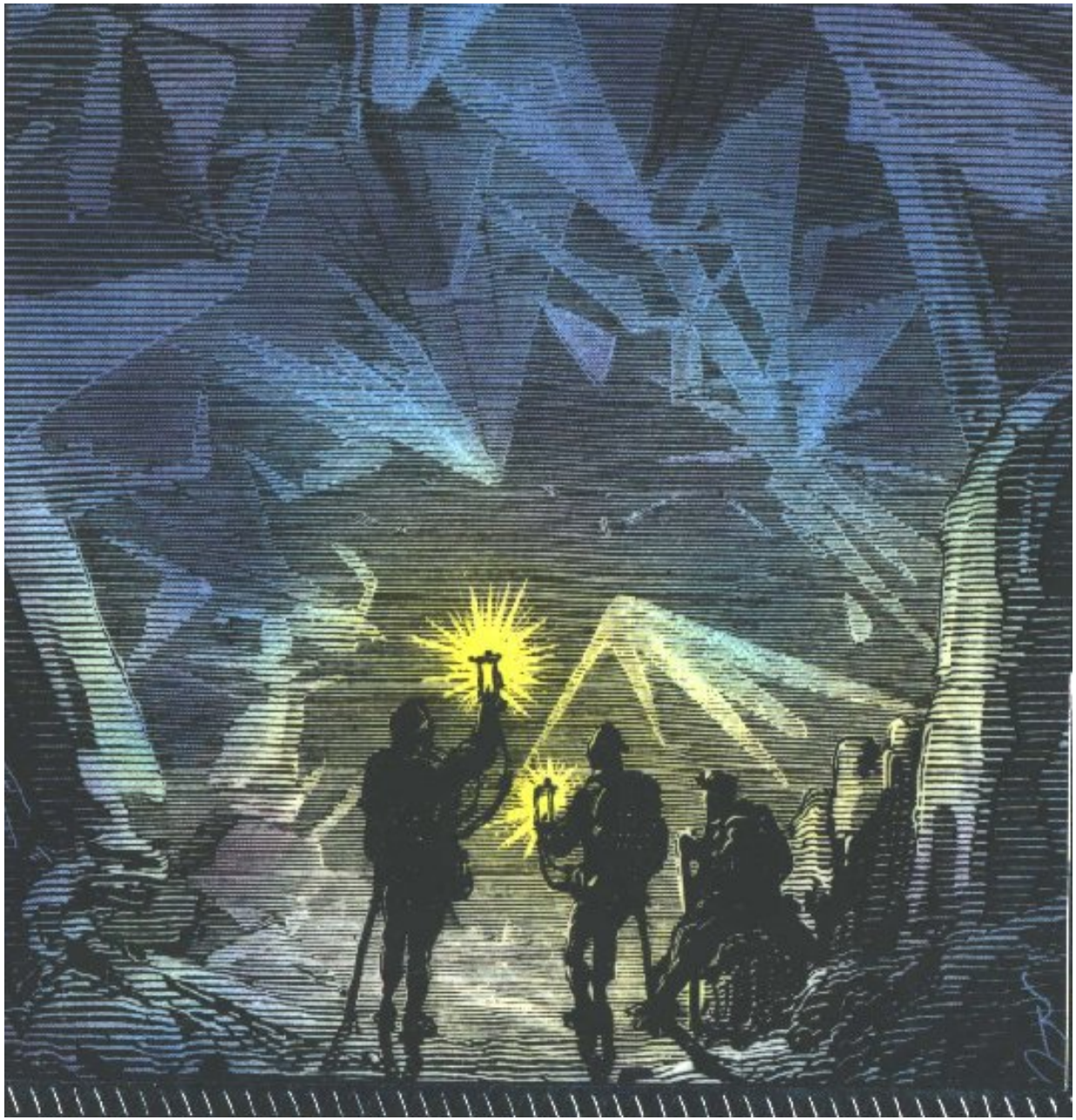
Ulrich R. Christensen

Dante Alighiri,
Divina Comedia
14th century

Athanasius Kircher, 17th century

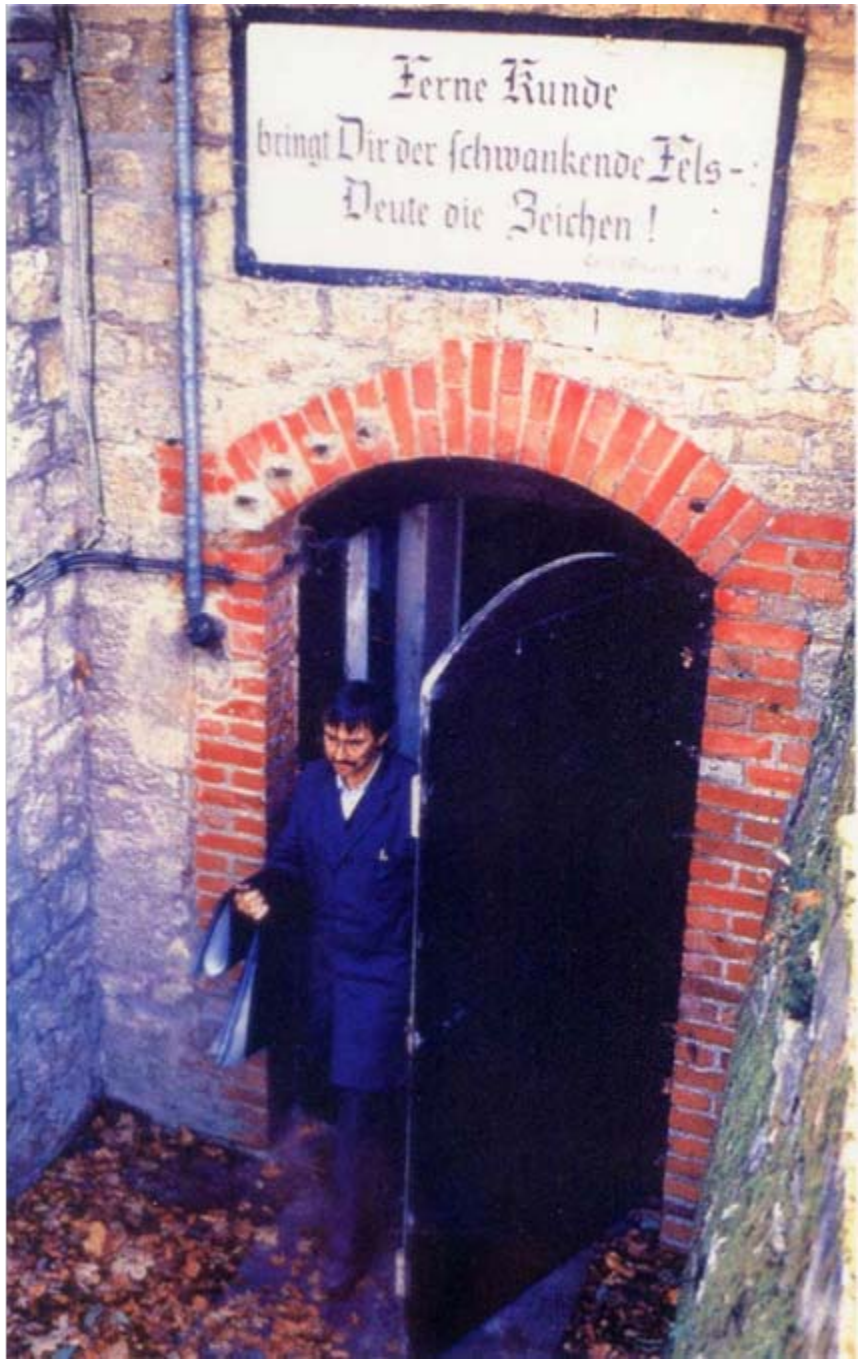


Jules Verne: Journey to the centre of the Earth, 19th century



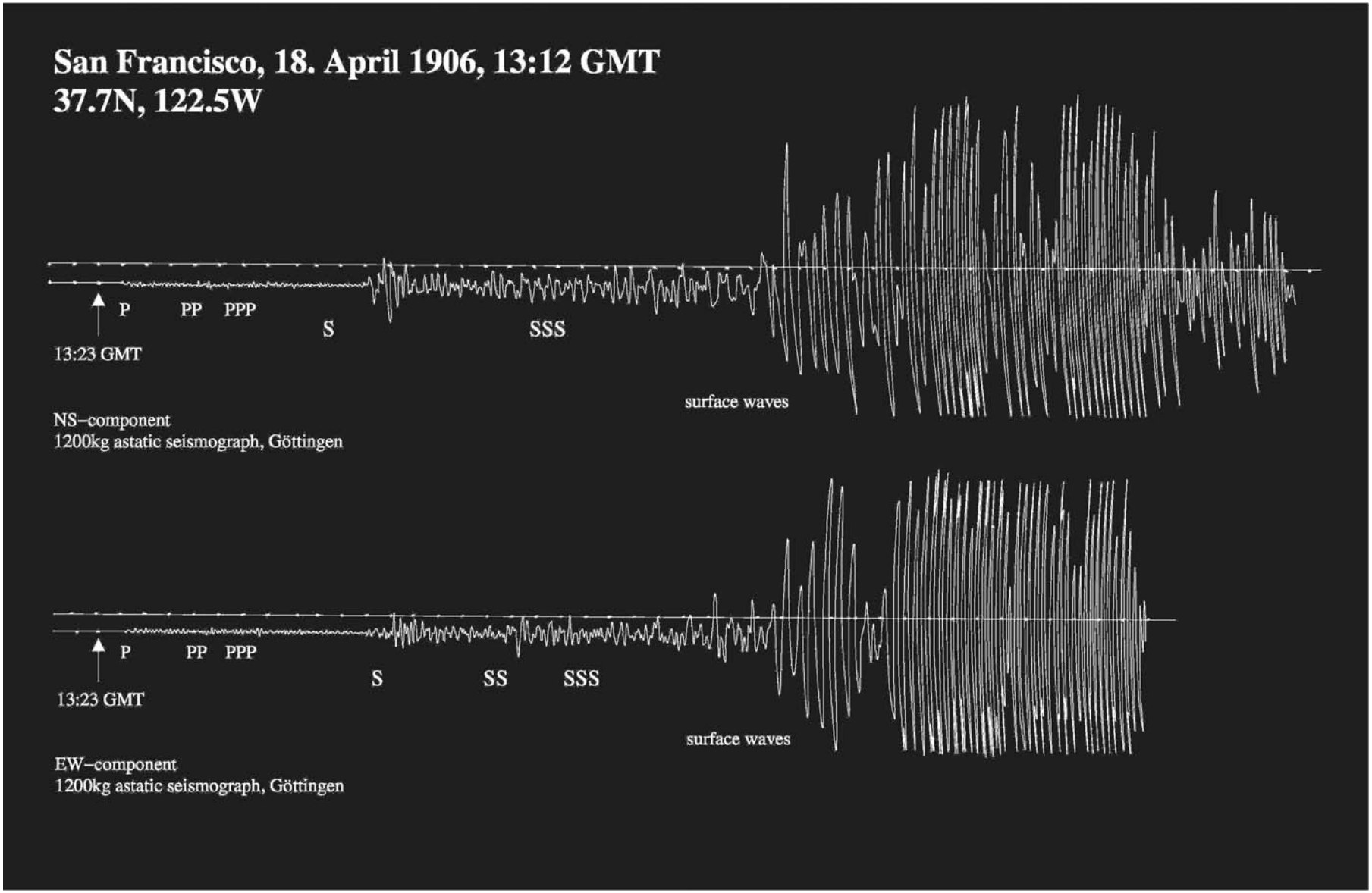
Continental deep drill hole,
Germany 9042 m

Entrance to the old seismological observatory in Göttingen, Germany
(E. Wiechert, 1903)

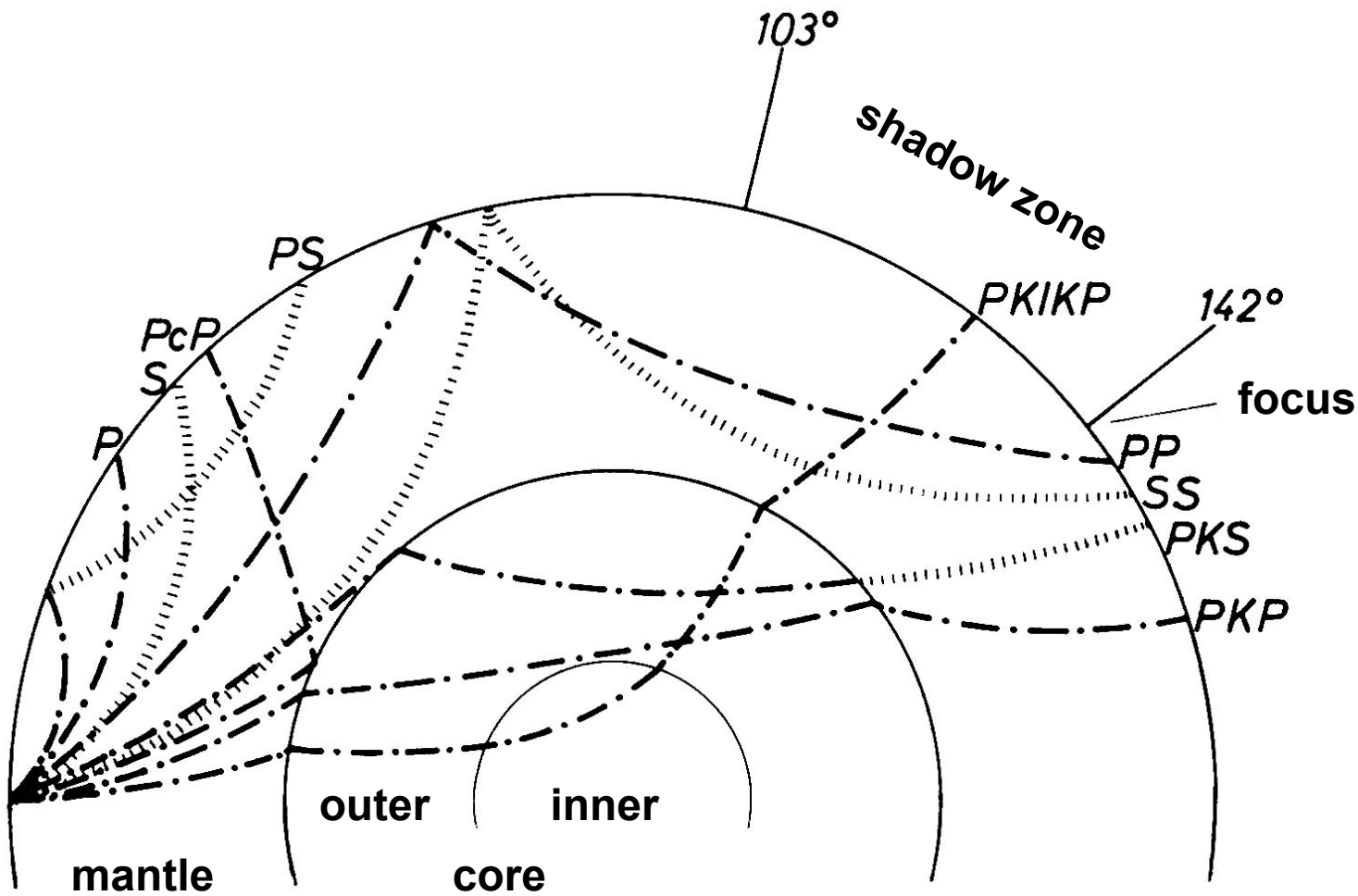


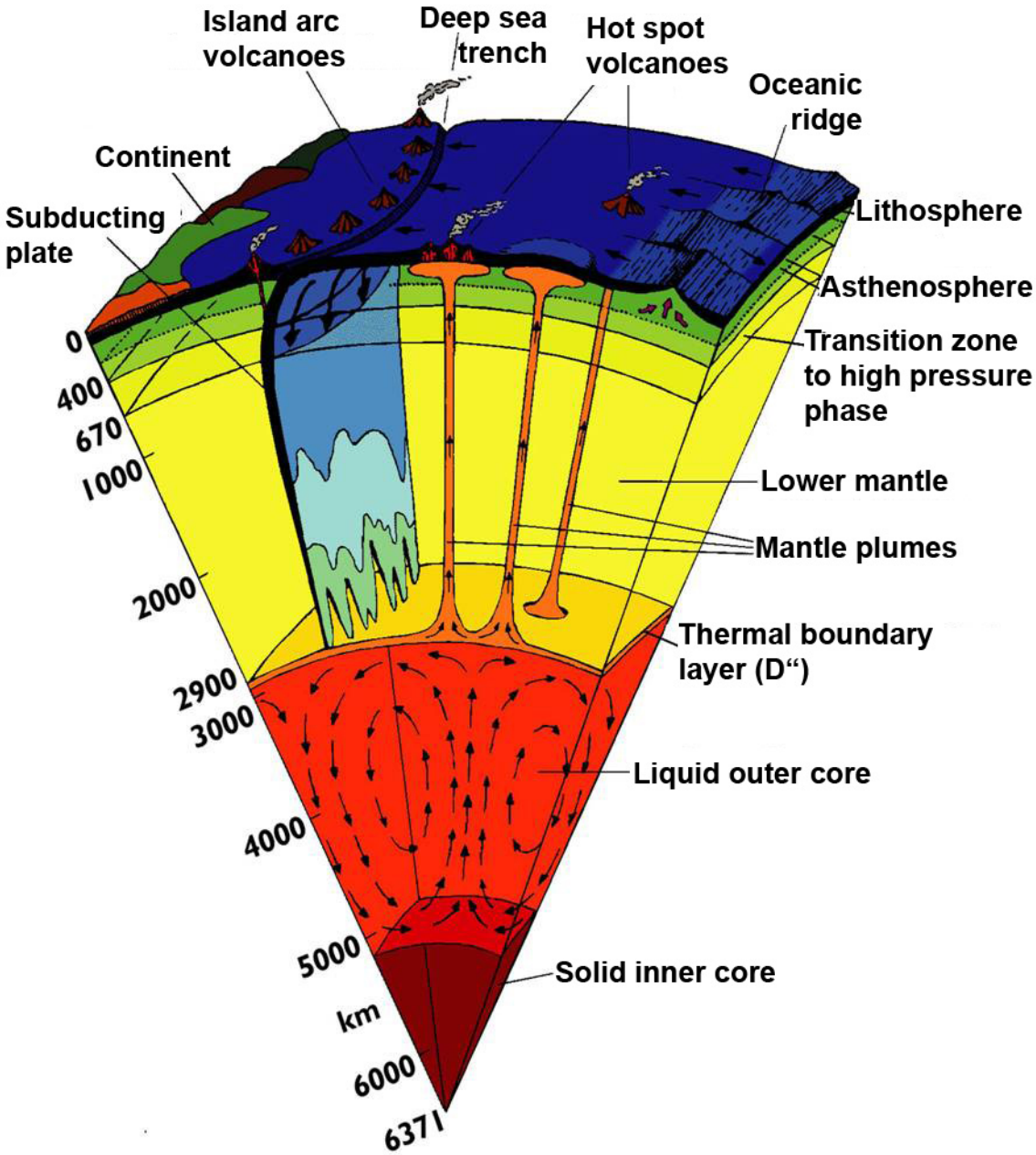
Message from far away brings the shaking rock: read the signs !

Registration of the San Francisco, 1906, Earthquake taken in Göttingen

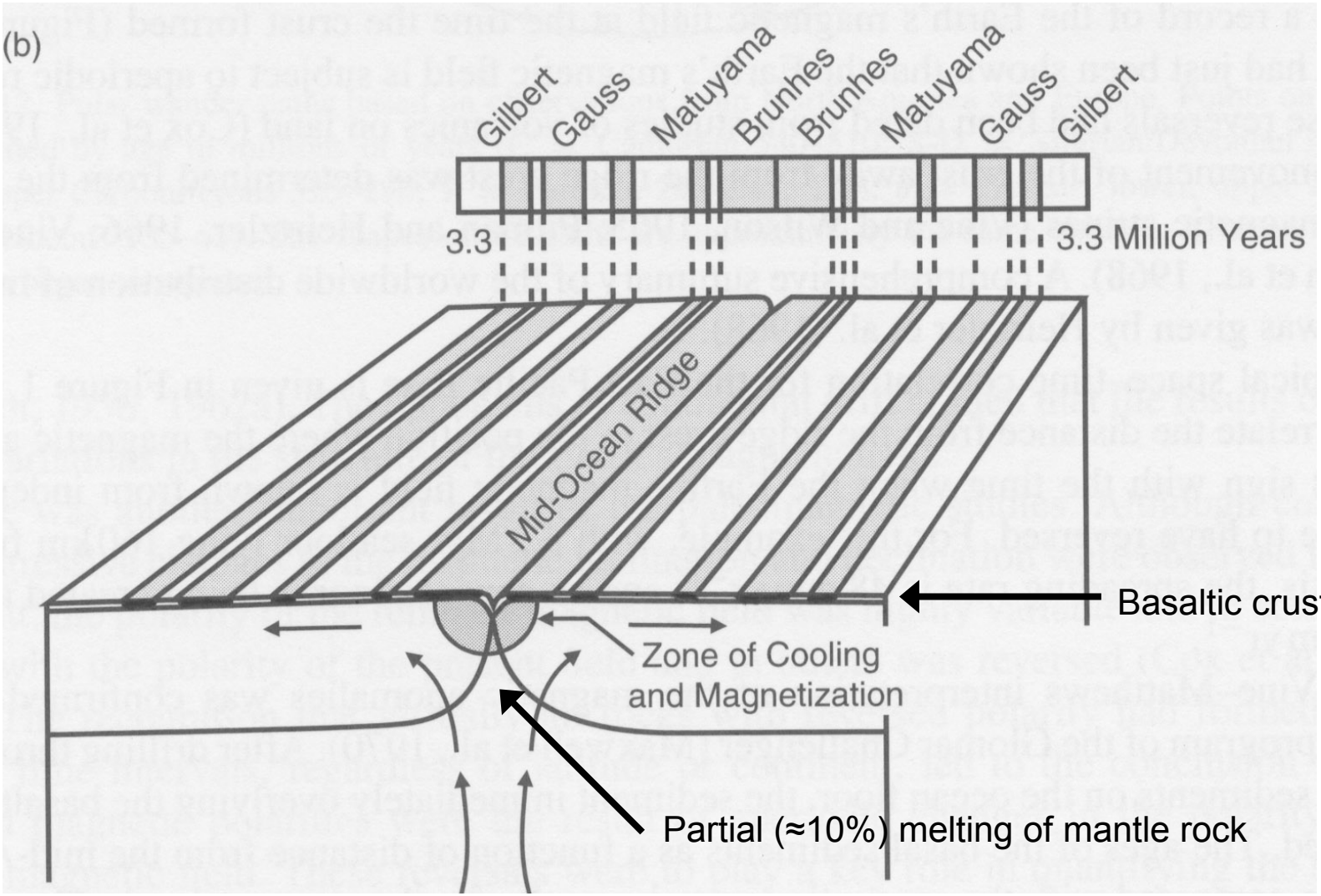


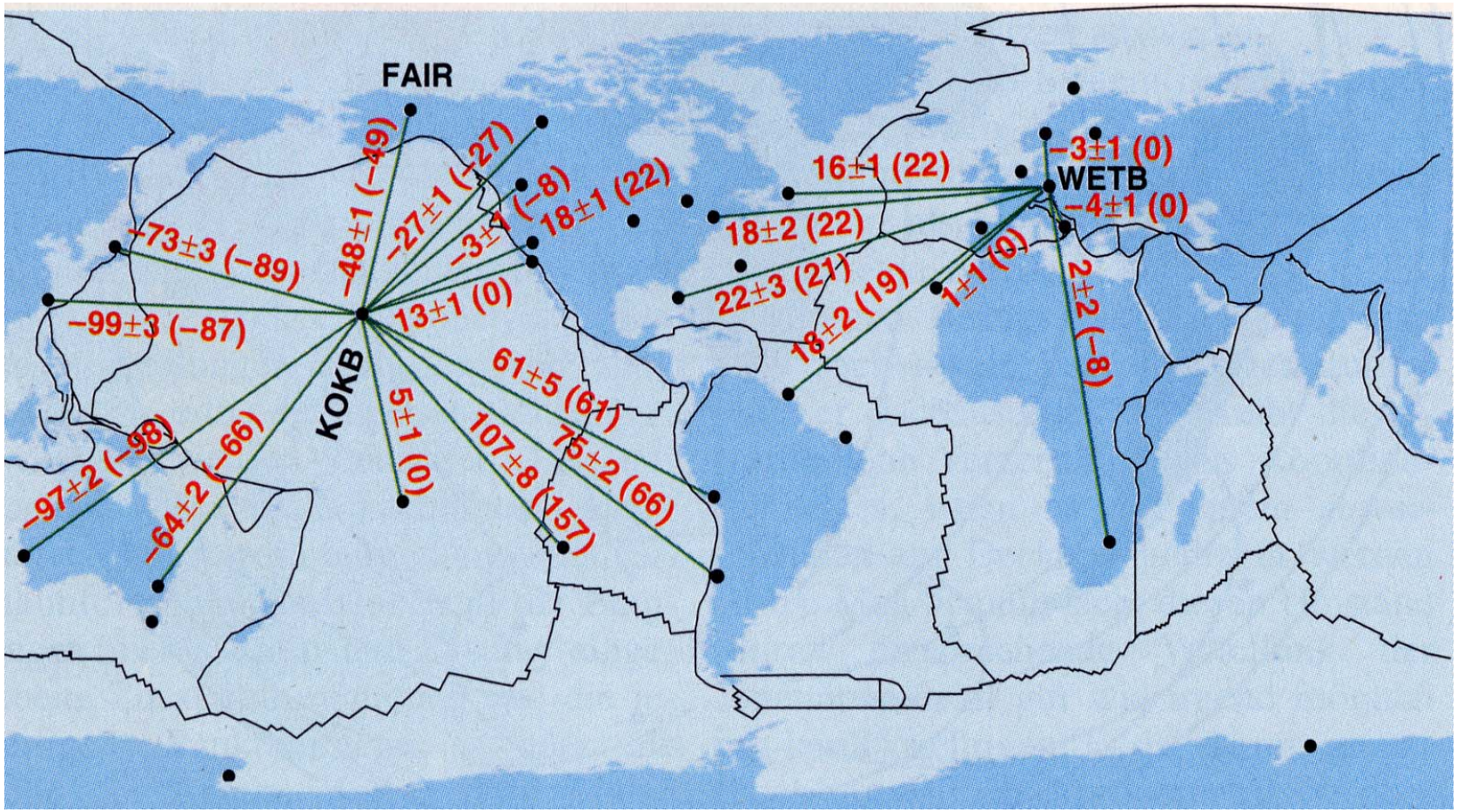
Seismic wave propagation through the Earth



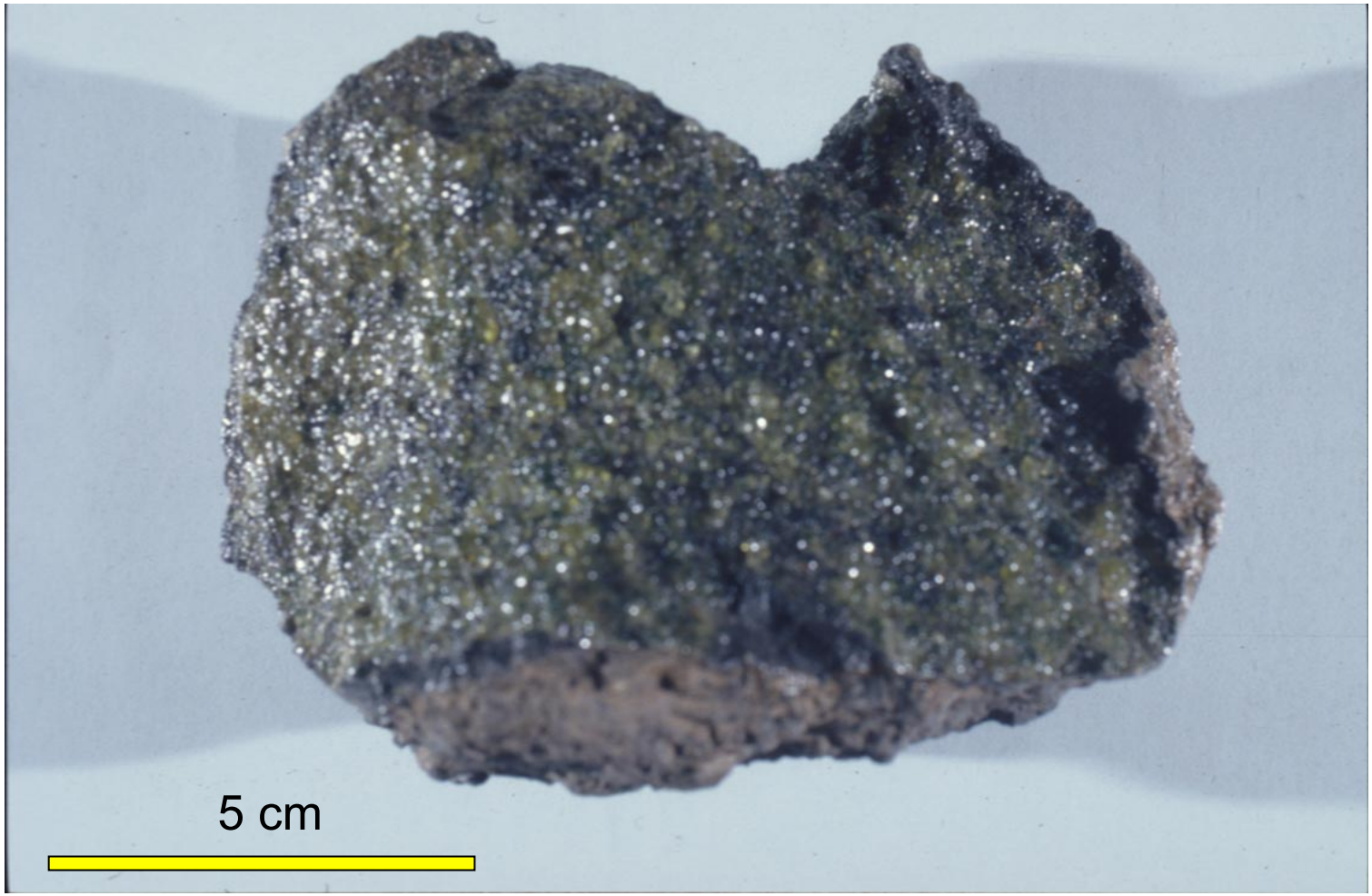

Island arc volcanoes
Deep sea trench
Hot spot volcanoes
Oceanic ridge
Continent
Subducting plate
Lithosphere
Asthenosphere
Transition zone to high pressure phase
Lower mantle
Mantle plumes
Thermal boundary layer (D“)
Liquid outer core
Solid inner core
0
400
670
1000
2000
2900
3000
4000
5000
km
6000
6371

Formation of magnetic lineations at mid-oceanic ridges



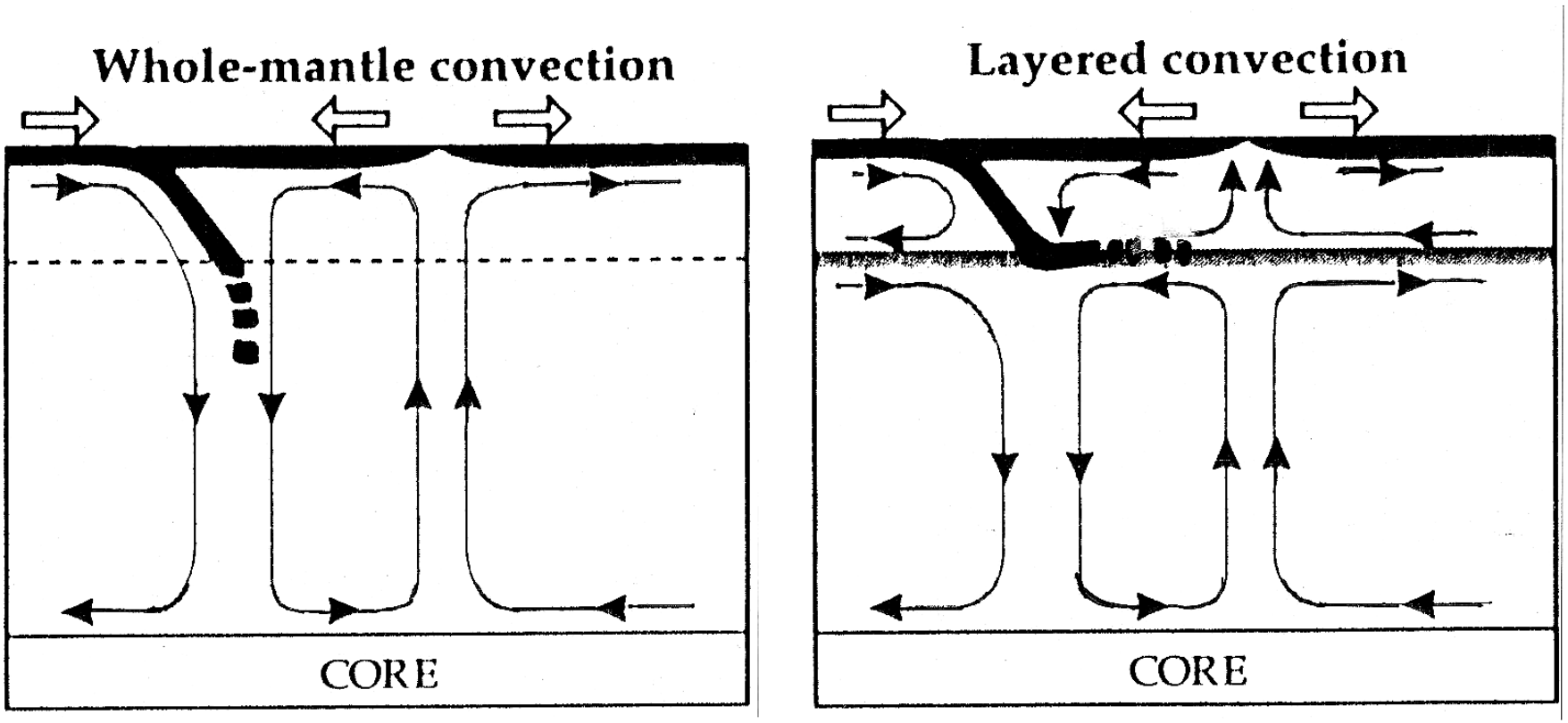


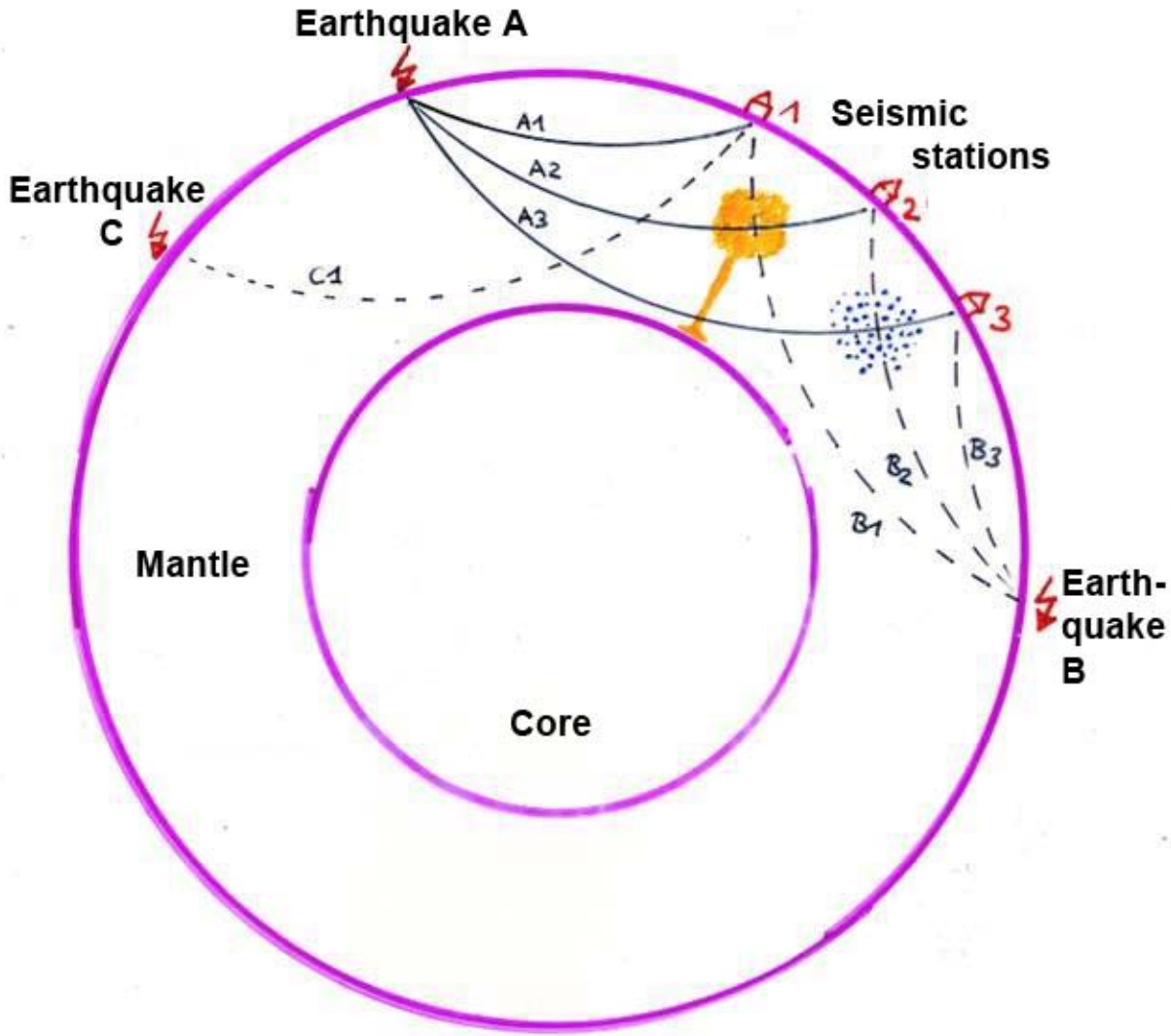
Comparison of relative movement in mm/yr obtained by GPS measurements and (in parantheses) from geophysical information



Mantle xenolith: 60 – 70% Olivine $(Mg_{(1-x)}Fe_x)_2SiO_4$ $x \approx 0.11$

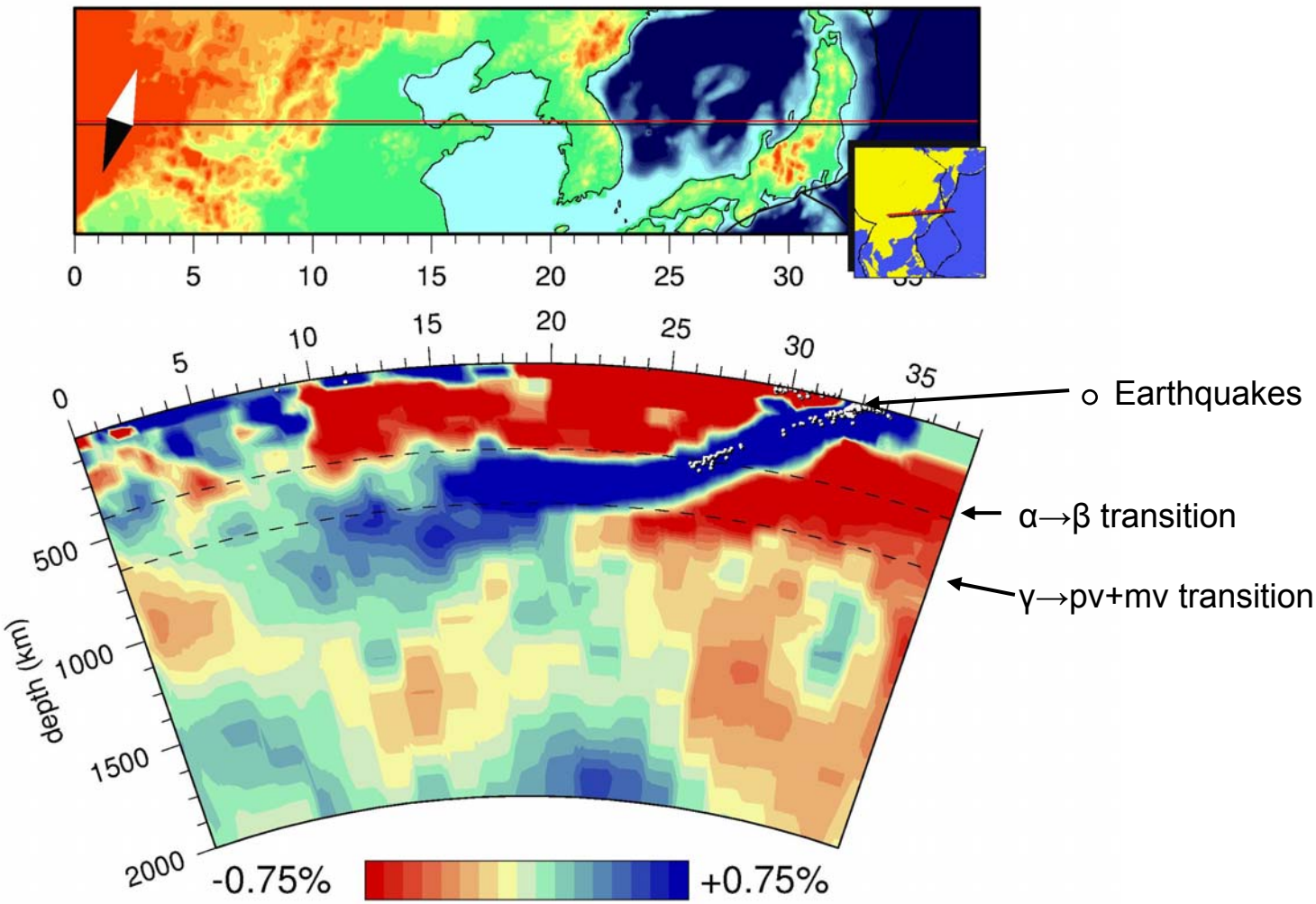
Two end-member models of convection in the Earth‘s mantle



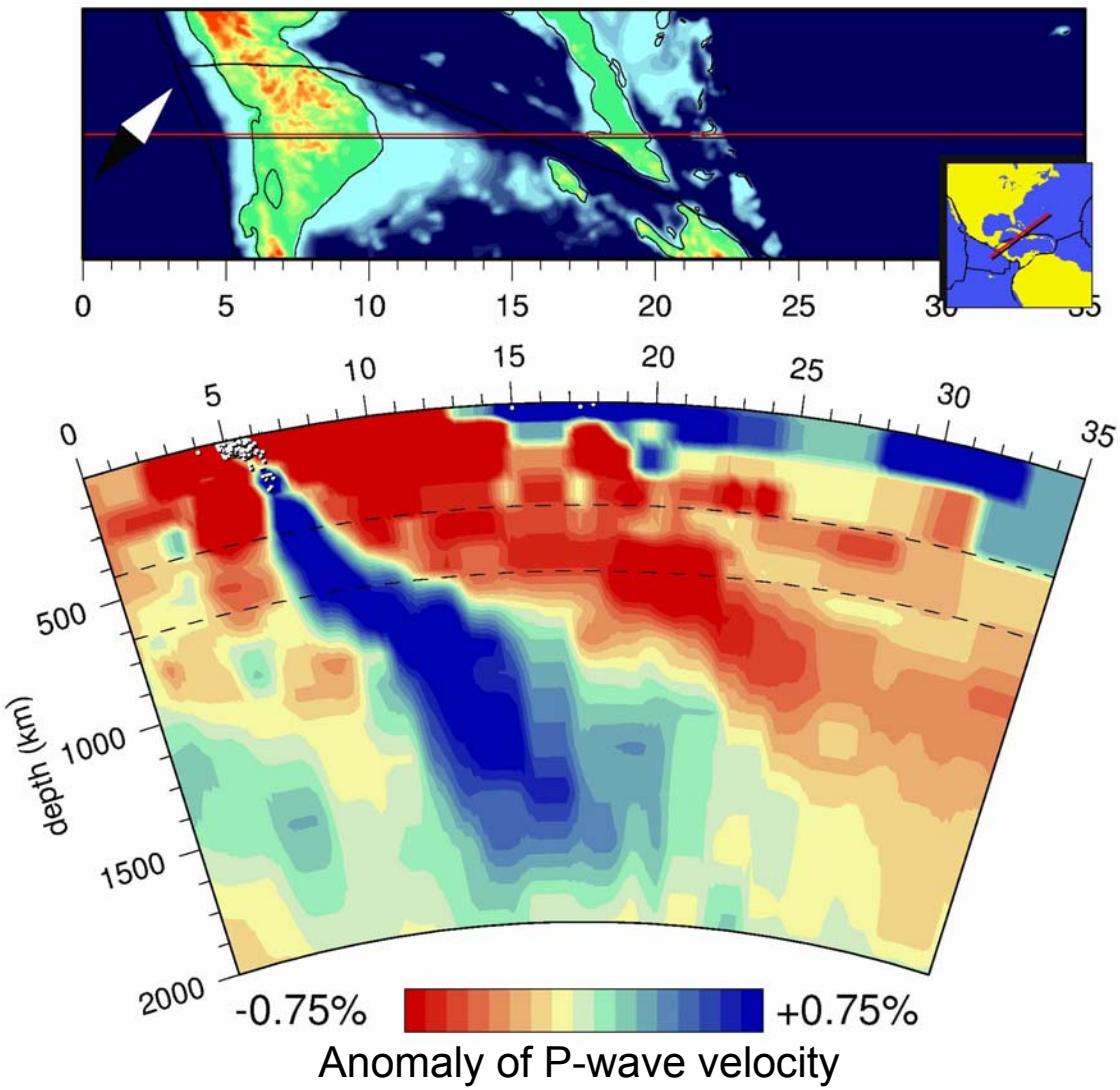


Seismic tomography

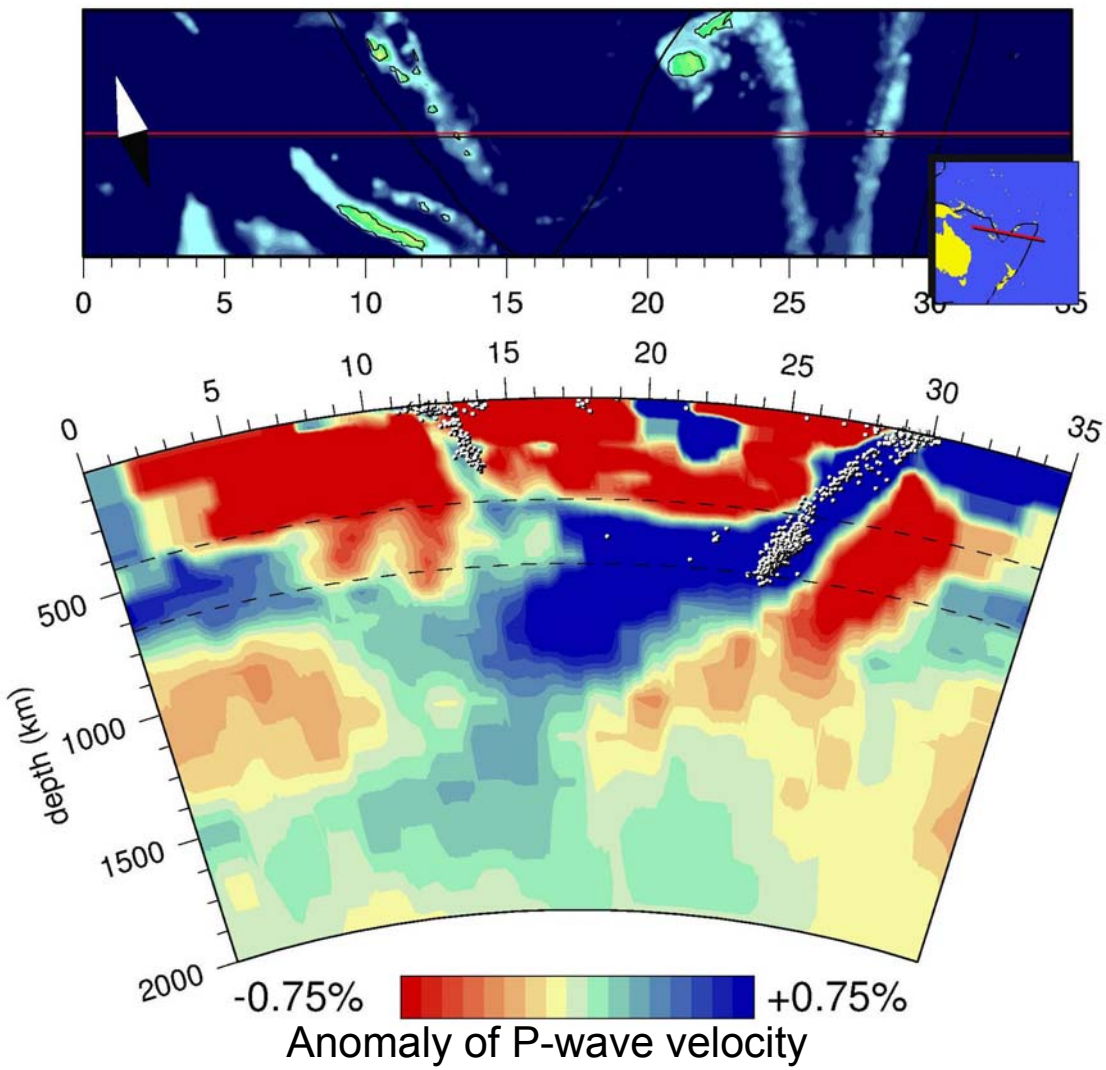
Cross-section through tomographic image of the mantle: Japan, Korea, Northern China: Subducted Pacific plate stagnates in transition zone ?



Cross-section through tomographic image of the mantle: Middle America and Carribean: Subducted Pacific penetrates into lower mantle



Cross-section through tomographic image of the mantle: Tonga-Fidschi: Subducted Pacific plate is retarded, but eventually penetrates



2D numerical model of slab subduction through a phase boundary