PICASSO: Lithosphere Structure in the Western Mediterranean from Ps Receiver Functions and Rayleigh Wave Tomography

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PICASSO: Program to Investigate Convective Alboran Sea System Overturn: BB Seismic Deployments

Topolberia (60BB)
Siberia (20BB)
PICASSO (95BB: PASSCAL, USC, Rice)
Spanish Nat’l Networks
Portuguese Nat’l Network
Moroccan Nat’l Network
University of Muenster
University of Bristol
1. Finite-frequency teleseismic P-wave tomography (Schmandt & Humphreys, 2010) in 3 frequency bands (1, 0.5, 0.3Hz). More than 250 stations.


CCP stack made with modified AK135 velocity model.
P-Tomography 95 km & 205 km
P-Tomography ~330 km & 420 km

Max Bezada & Gene Humpherys, Univ Oregon
P-Tomography  520 km &  630 km
P-Tomography & Rayleigh Wave Tomography at ~90 km Depth

Max Bezada, Univ Oregon
Imma Palomeras, Rice
P-Tomography & Rayleigh Wave Tomography 90-105 km Depth

Depth = 90 km

Depth = 105 km

Max Bezada, Univ Oregon
Imma Palomeras, Rice
Rayleigh Wave Tomography
75 km

Depth = 75 km

60 km Depth

Depth = 60 km
Rayleigh Wave Tomography

Depth = 45 km

Depth = 35 km

Vs (km/s)

V
RFs & Shear Velocities: Betics
RFs & Shear Velocities: Rif

Ps 1 Hz

Rif Mountains

Moho

LAB??

Ps 1 Hz

Rif Mountains

Moho

LAB??

RFs & Shear Velocities: Rif

lat=35.00

Depth (km)

Longitude (degree)

Latitude (km)

Longitude (degree)

Vs (km/s)

DVs (%) Vs=4.3 km/s
Ps RFs & Rayleigh Wave Tomography

Sally Thurner & Imma Palomeras, Rice
• Near Vertical Slab Hanging Beneath Center of Alboran Sea (NE dip) through Transition Zone
• Slab Appears Folded Around Near Vertical Axis

• Thin Lithosphere Beneath Rif, Middle Atlas, Gibraltar & Parts of Southern Spain
• Thick Lithosphere under Variscan Spain and High Atlas

• Betic & Rif Crusts Suggest Overthrusting
  • Wedge Tectonics?