

Pn Tomography in Northern Morocco and Geodynamic Implications

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Recent high seismic activity in the Rif-Alboran boundary zone (Al-Huceima region) provides new data to reconsider geodynamic aspects in this part of the Ibero-Maghreb plate boundary. Upper mantle tomography structure in Northern part of Morocco is investigated by imaging Pn variations and anisotropy. The results obtained indicate zones of high velocity in eastern Rif and Meseta while low velocity dominates the Atlas upper mantle. The lower lithosphere structure in the Rif mountains show marked variations between Eastern Rif and western parts. Low velocity of the Atlas lithosphere, and Miocene and Quaternary magmatism fit with a process of upwelling mantle. However, intermediate depth seismicity beneath the central Atlas mountains is evidence for descending flows. Both upward and descending motions seem better explained by a process of delamination. In central Rif, the faults system may be deeply seated from Al huceima region to Taounate basin to explain East West complex Pn variation and related anisotropy in this region.

Key words: geodynamics, seismicity, Pn velocity, Atlas mountains, Morocco