

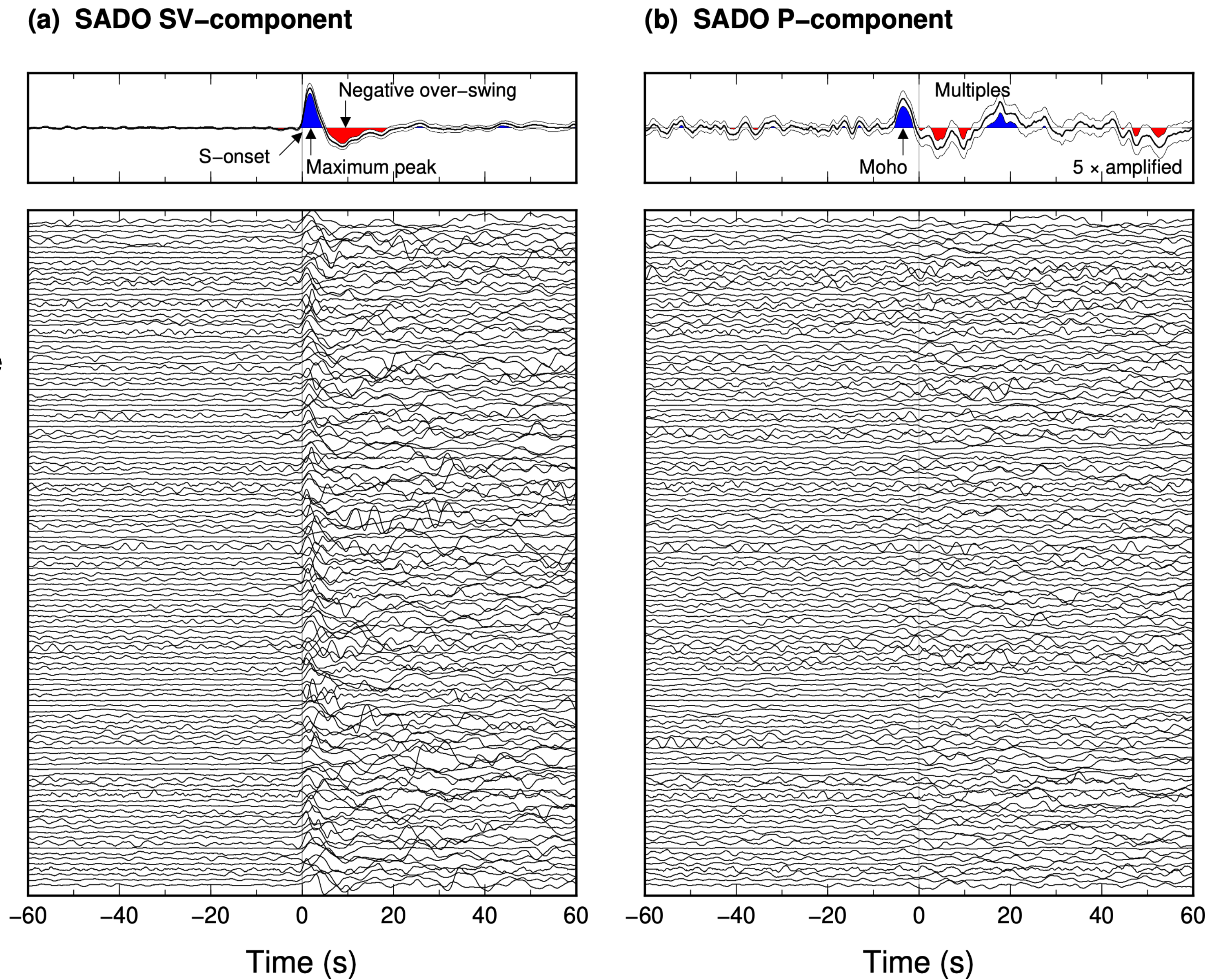
# Structure of the uppermost mantle from Sp and Ps converted waves

Rainer Kind, GFZ Potsdam, FU Berlin  
Stefan Schmid, ETH Zürich  
Xiaohui Yuan, GFZ Potsdam



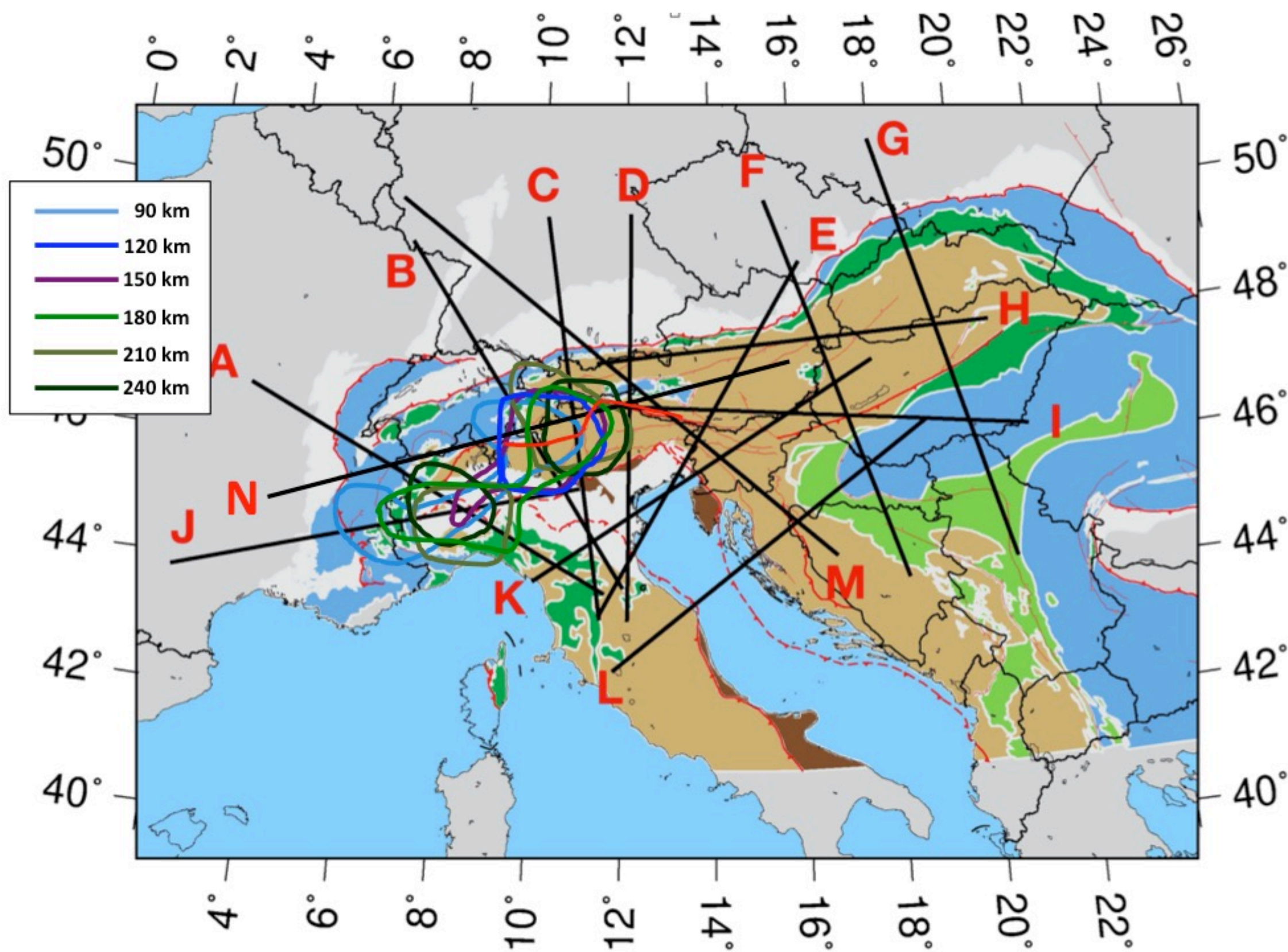


**Method:** Summation of unfiltered, amplitude normalized and sign corrected broadband traces aligned along the SV or P onset.

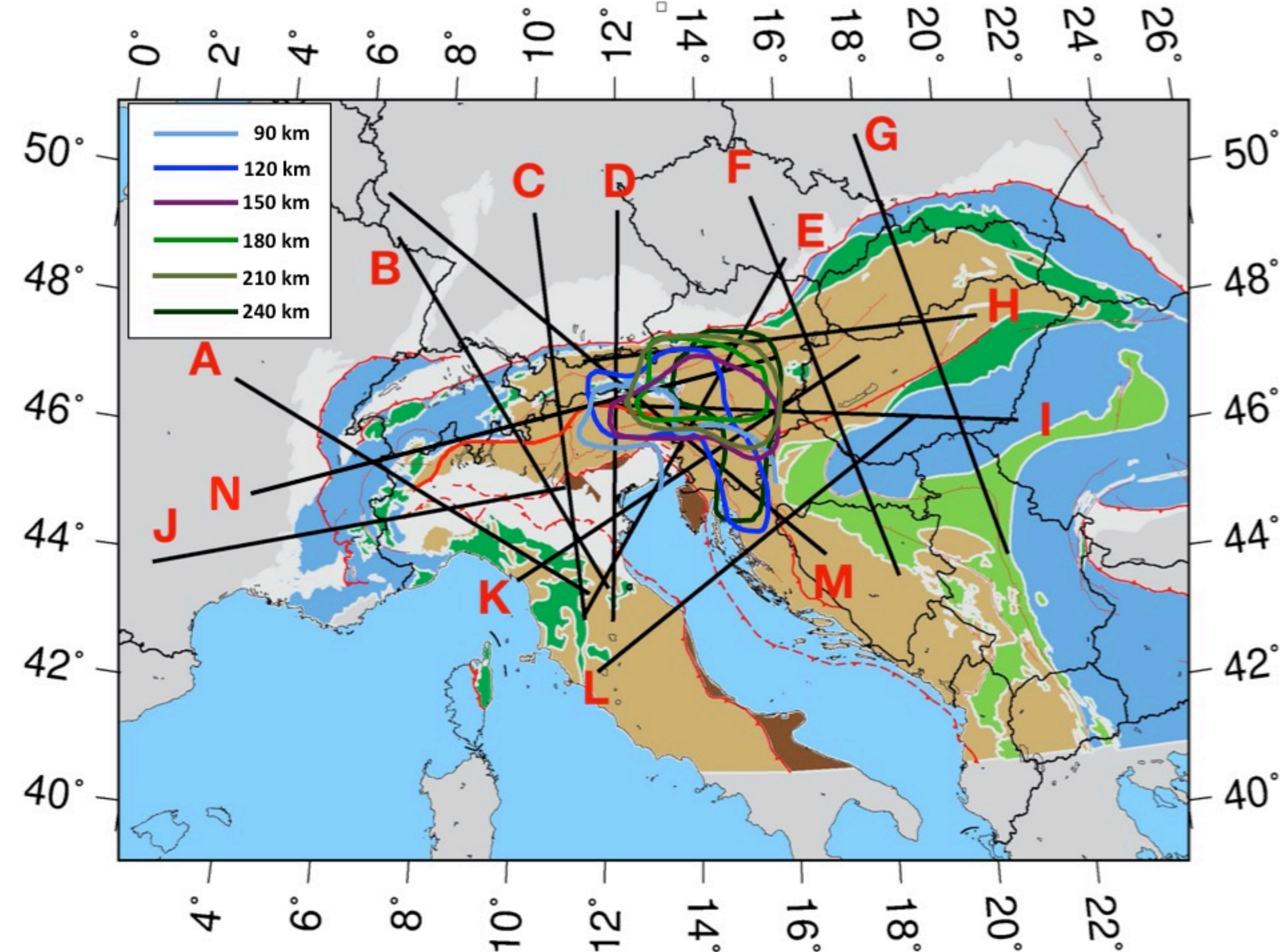




# Proposed Slab Locations and Considered Profiles



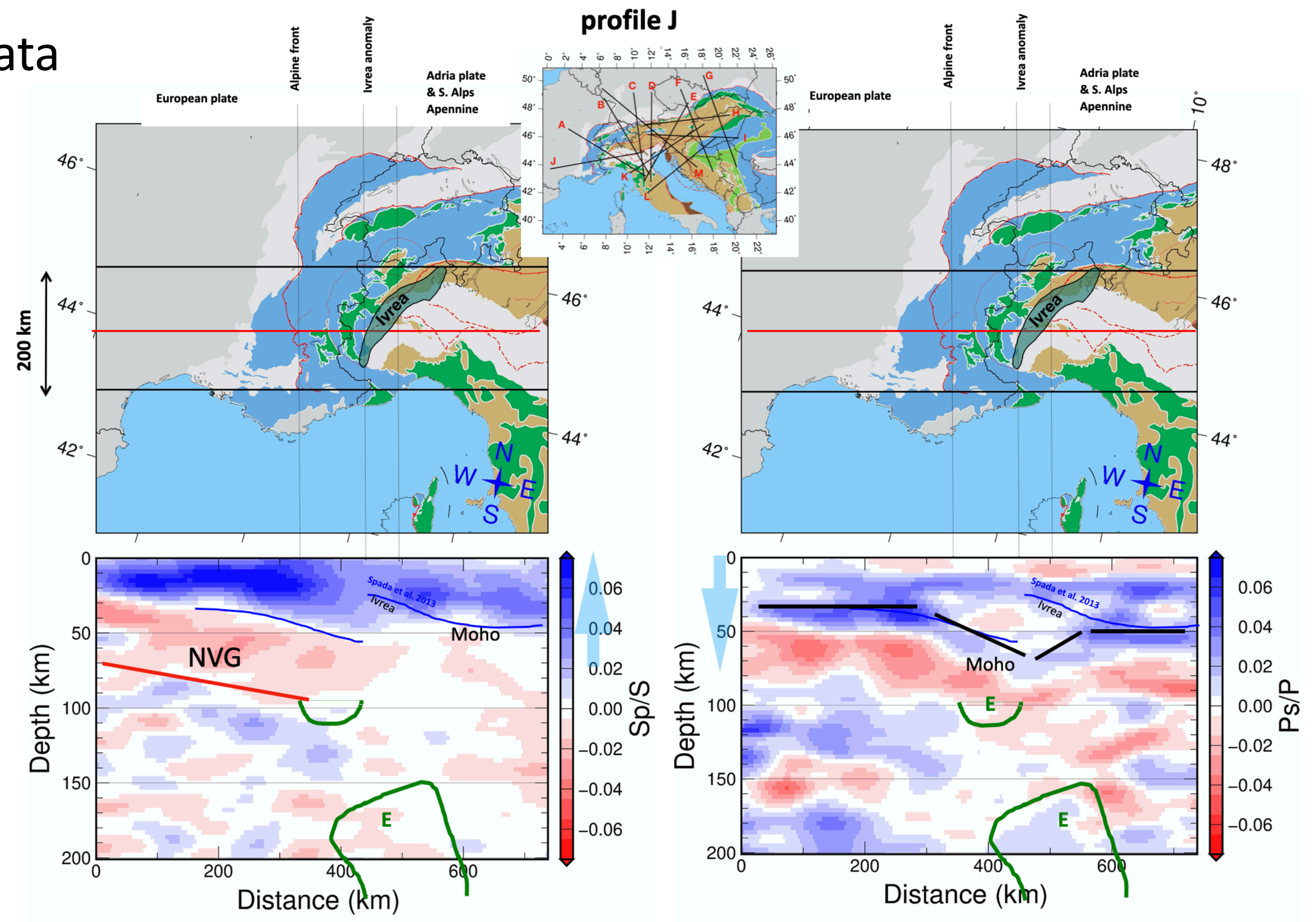
European slab Lippitsch et al. (2003)



NE dipping Adria slab Lippitsch et al. (2003)



# Migrated Sp and Ps data



**Profile J:** Left=Sp, right=Ps data, red=velocity decrease, blue=velocity increase downward.

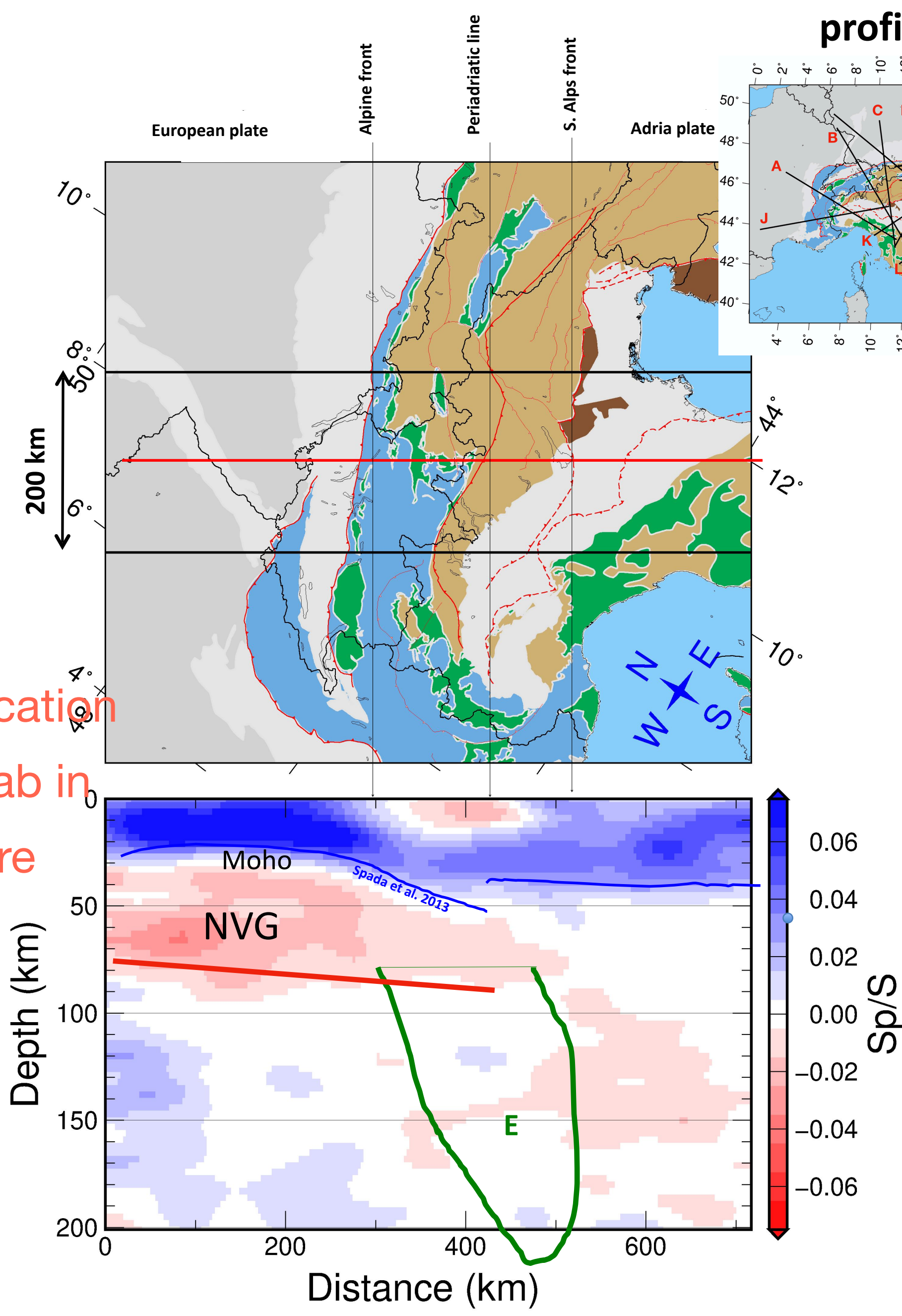
Green lines=Lippitsch slab, red line=bottom of negative velocity Gradient (NVG), black lines=Moho in Ps data.

Sp conversions are precursors (blue arrow left), red line marked at bottom of red signal.

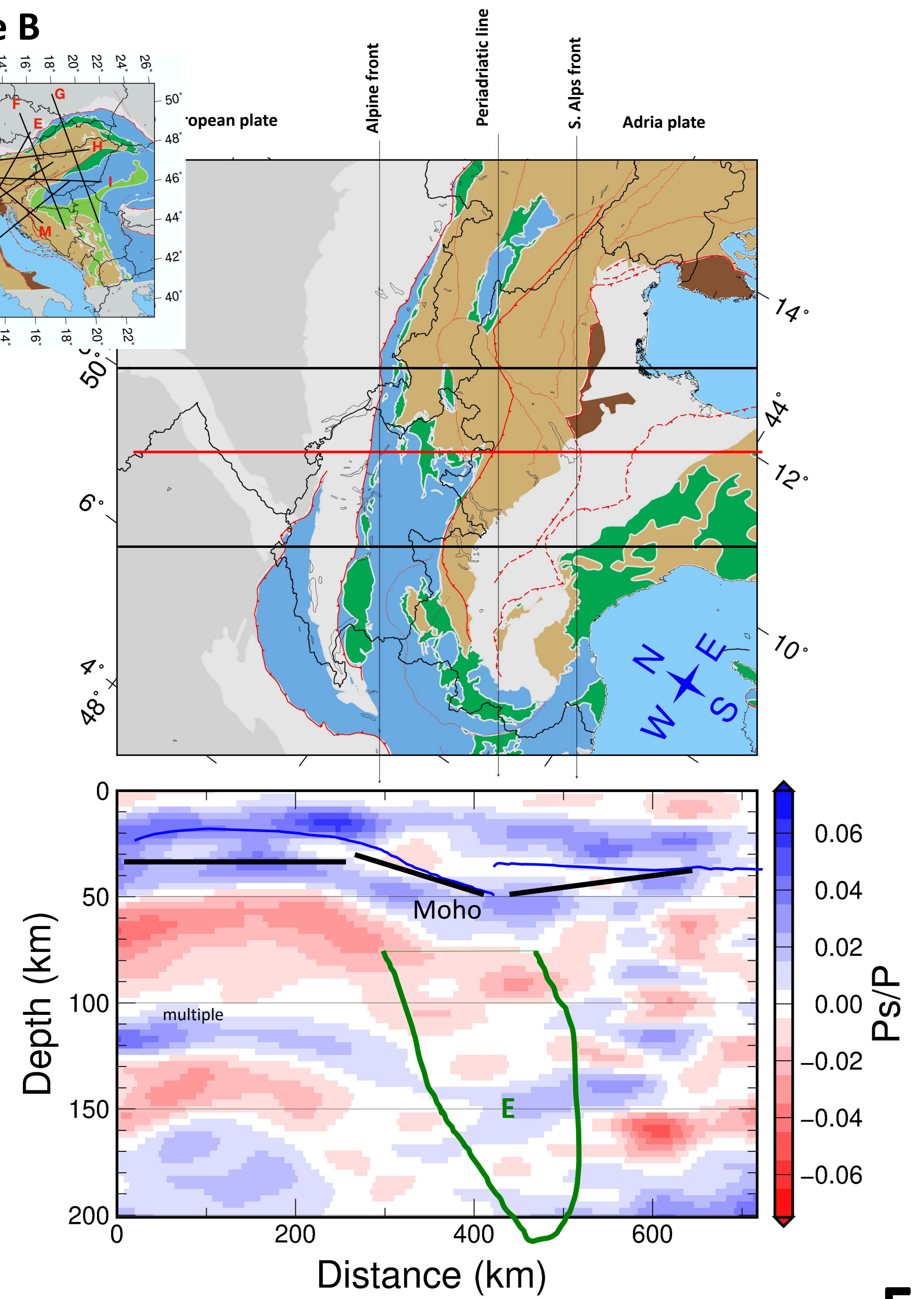
Ps conversions are in the coda of P (blue arrow right), black lines are marked at top of blue Moho signal.



Probably no indication  
of a European slab in  
mantle lithosphere

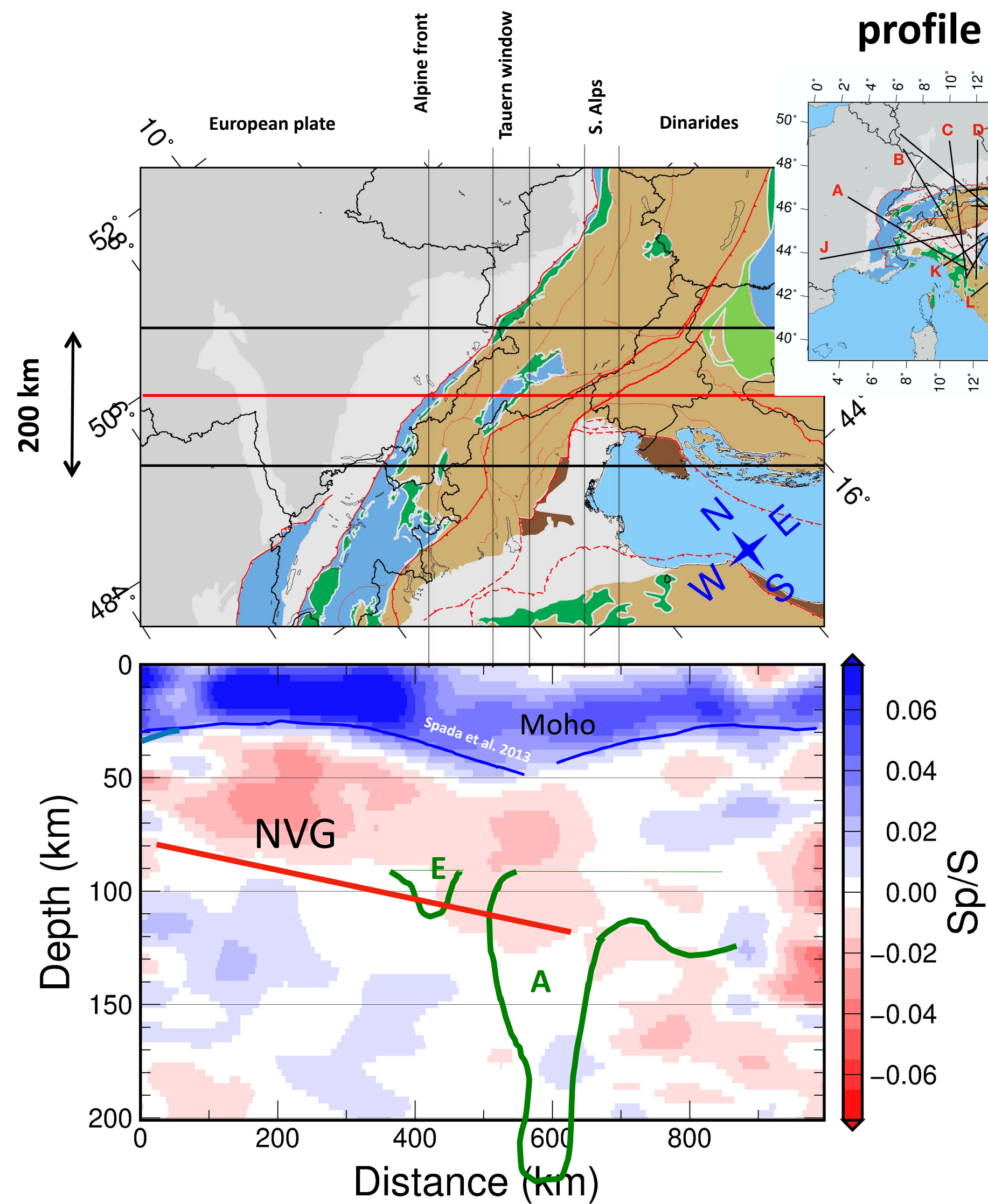


PS\_missec-s-12.bin 49.32 6.82 43.92 12 100 3

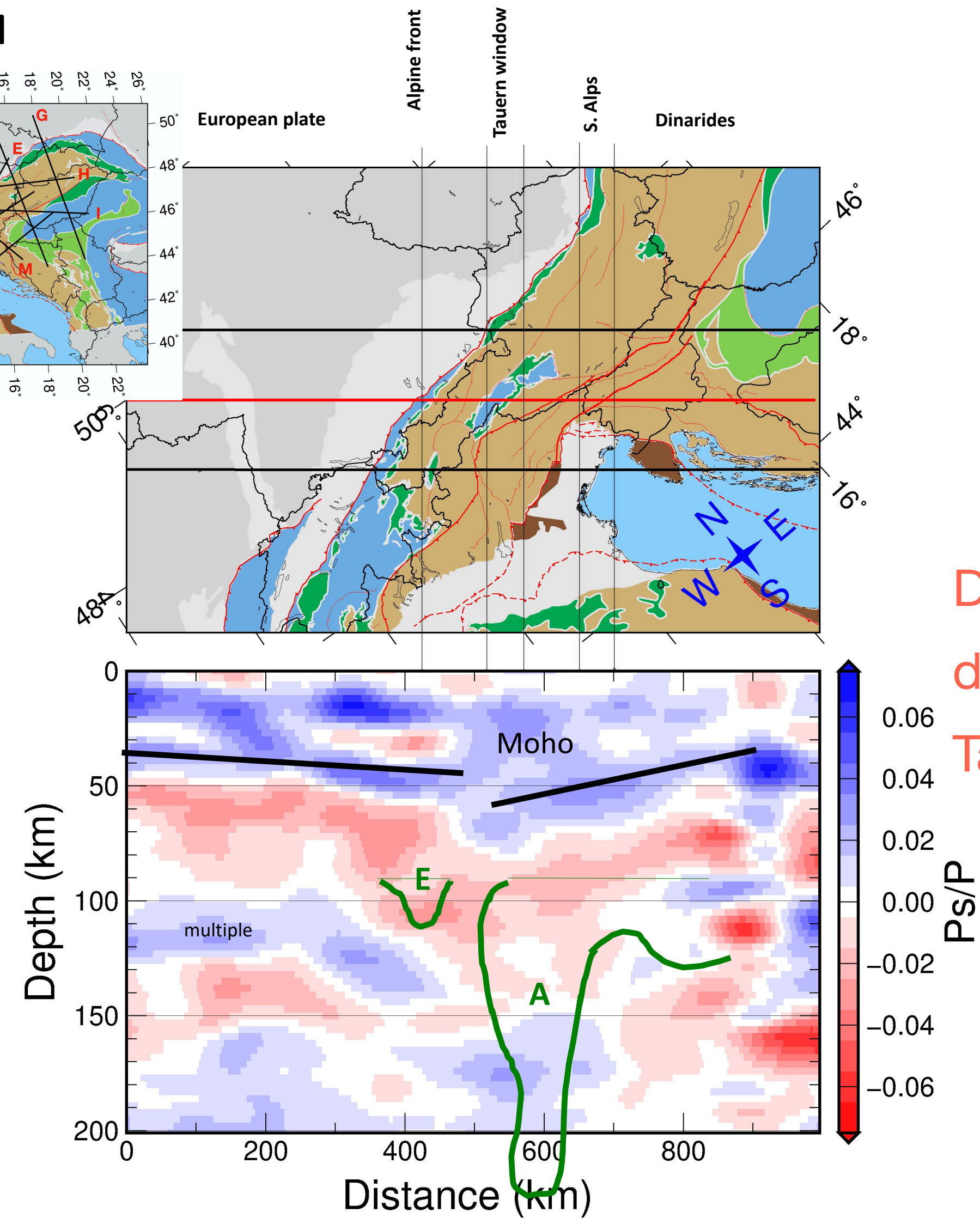


PS\_MIGR-P-219.PAR 49.32 6.82 43.92 12 100 3





PS\_missec-s-12.bin 50 6.5 44.4 16.8 100 3

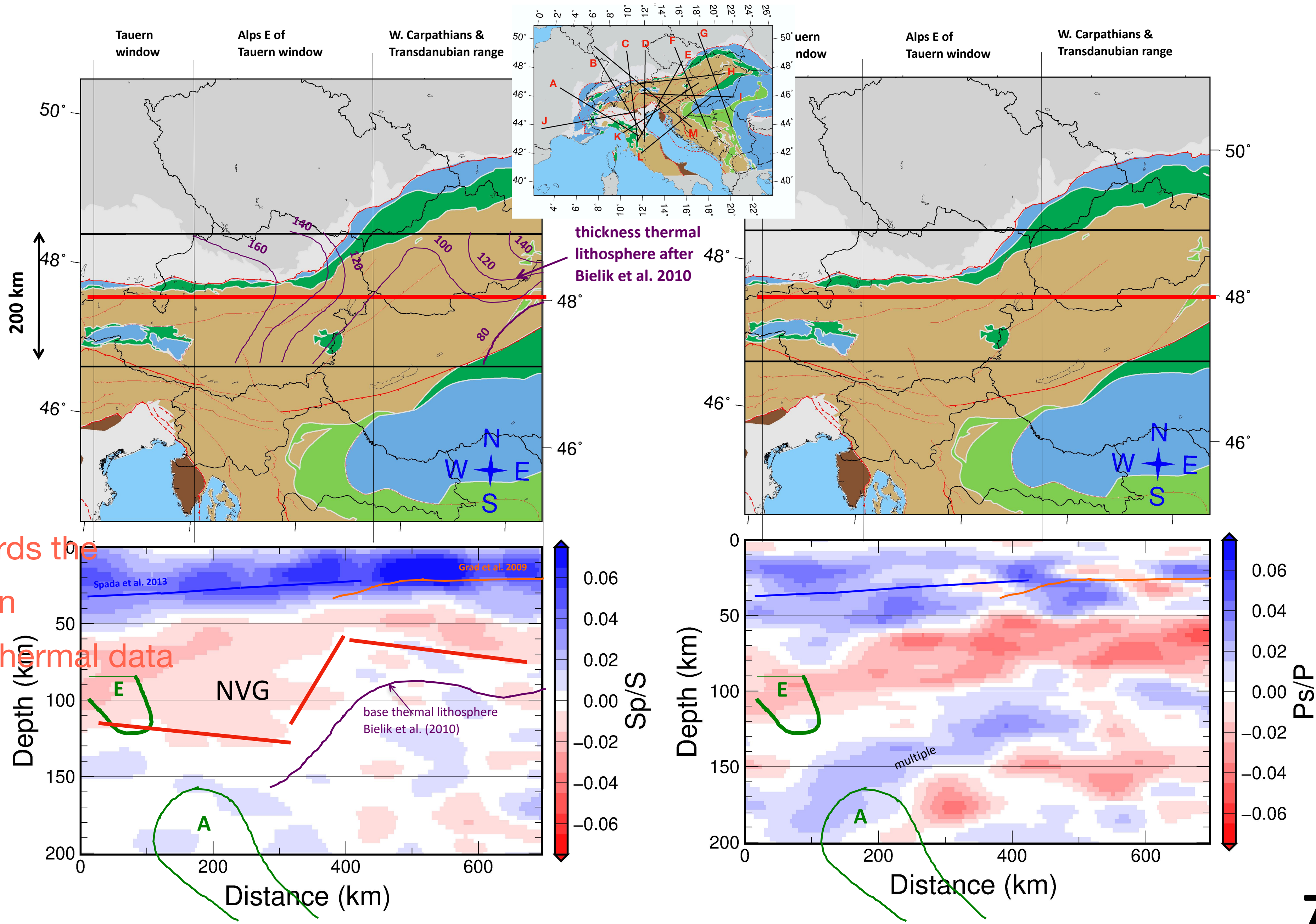


PS\_MIGR-P-219.PAR 50 6.5 44.4 16.8 100 3

Dinarides Moho is  
deepening to the  
Tauern Window



profile H

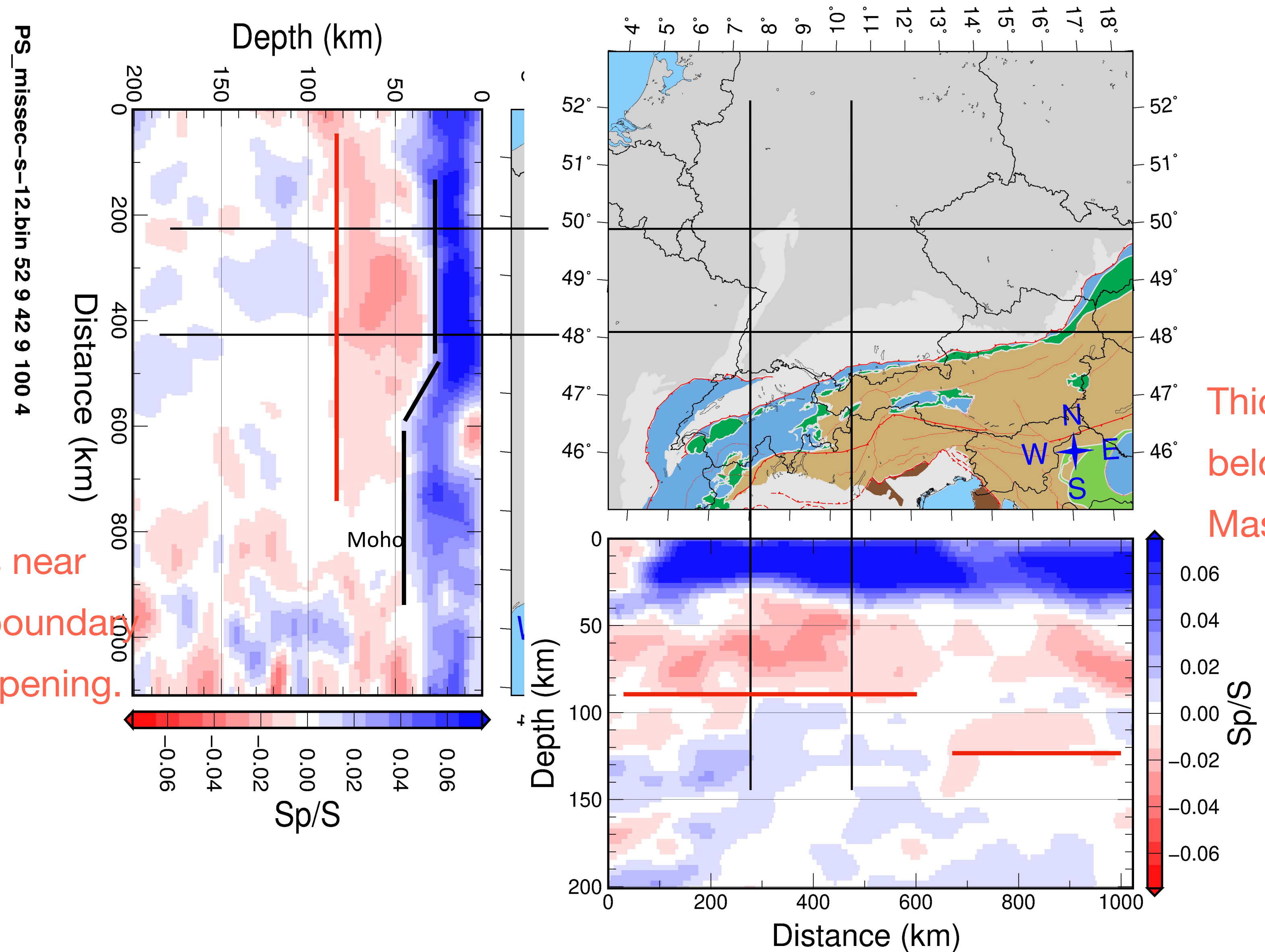


Rapid thinning of lithosphere towards the Pannonia Basin in agreement with thermal data

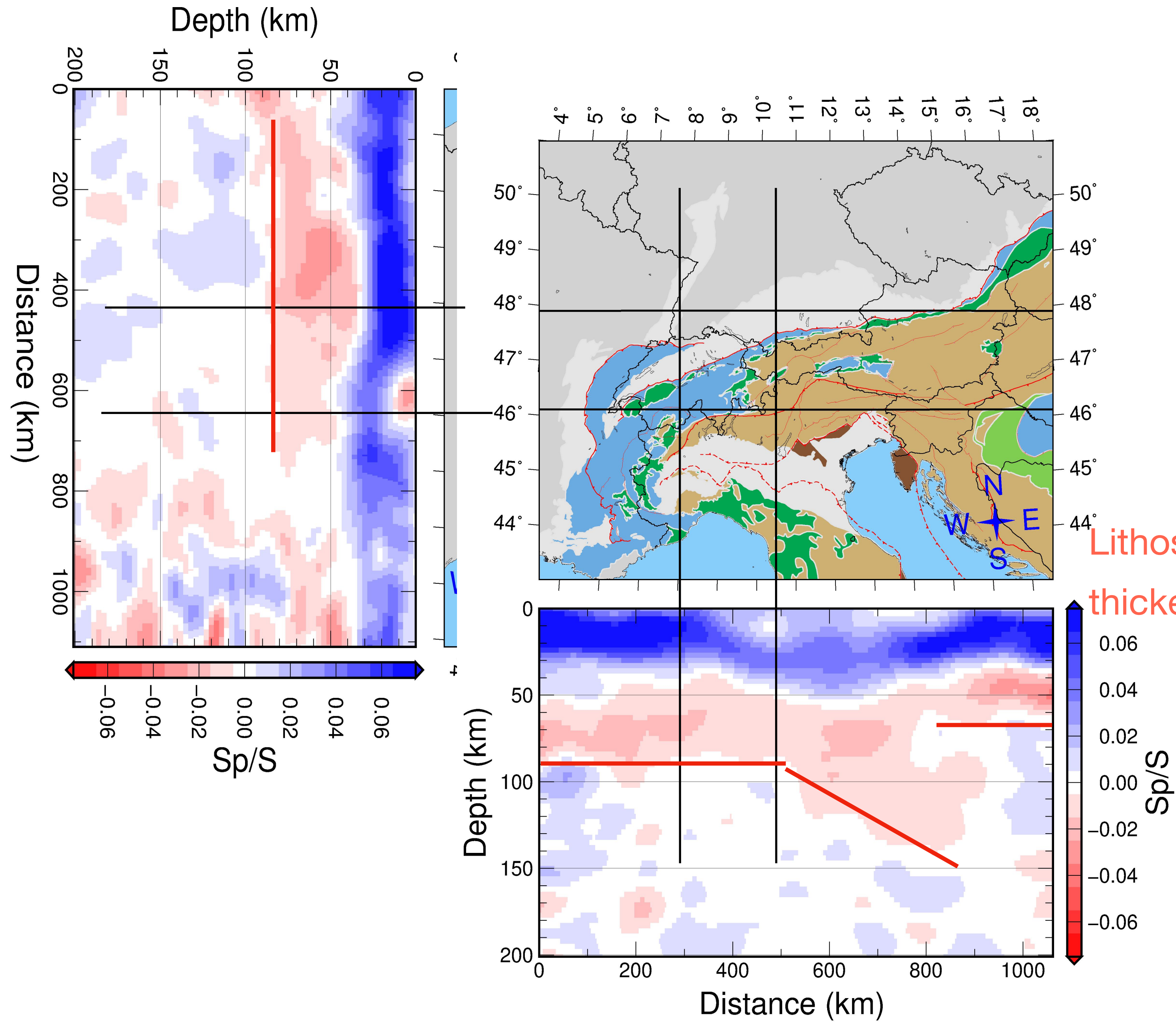


# Ps conversions

European lithosphere remains near 80km depth to the southern boundary of the Alps. Only Moho is deepening.





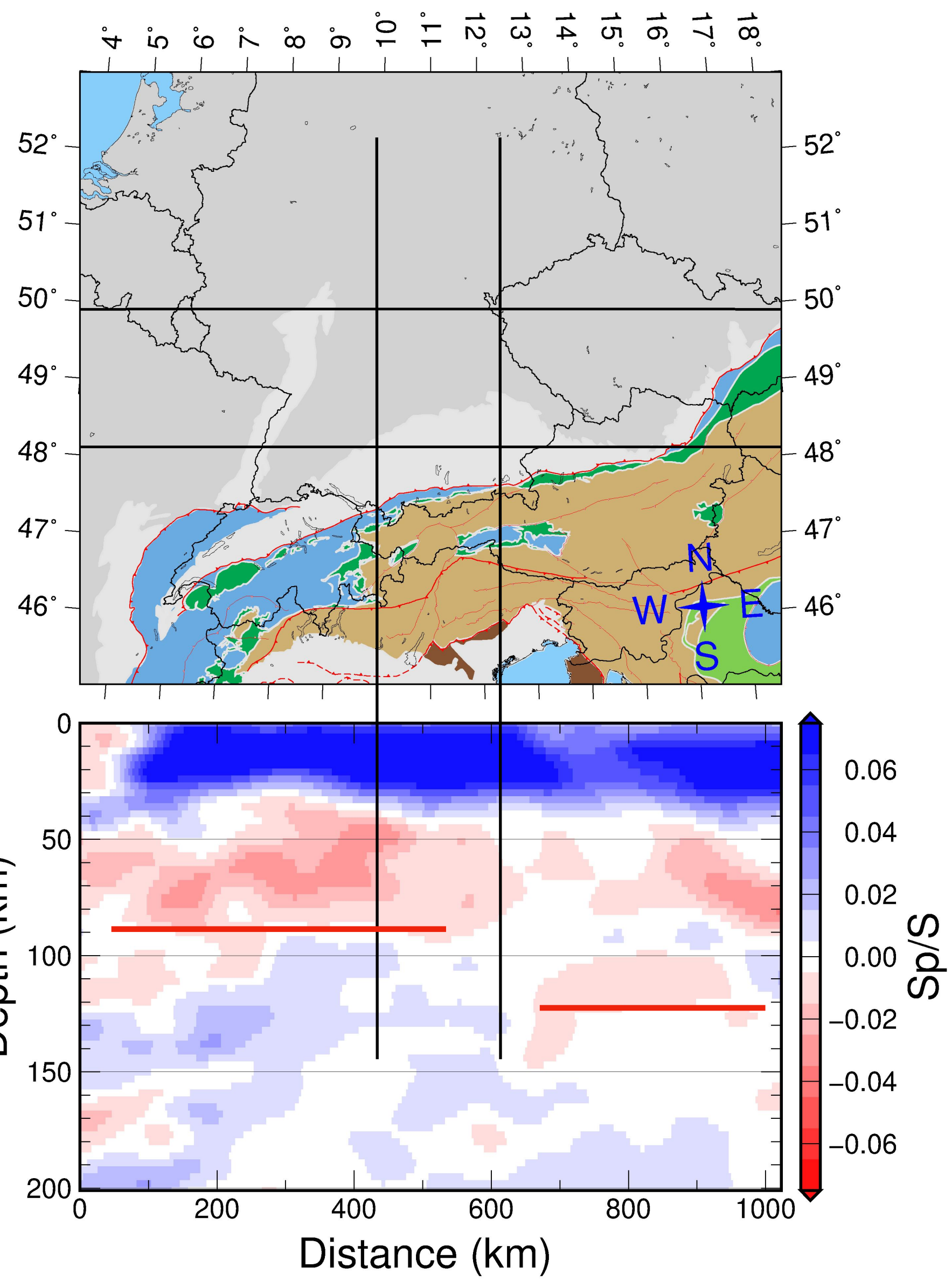
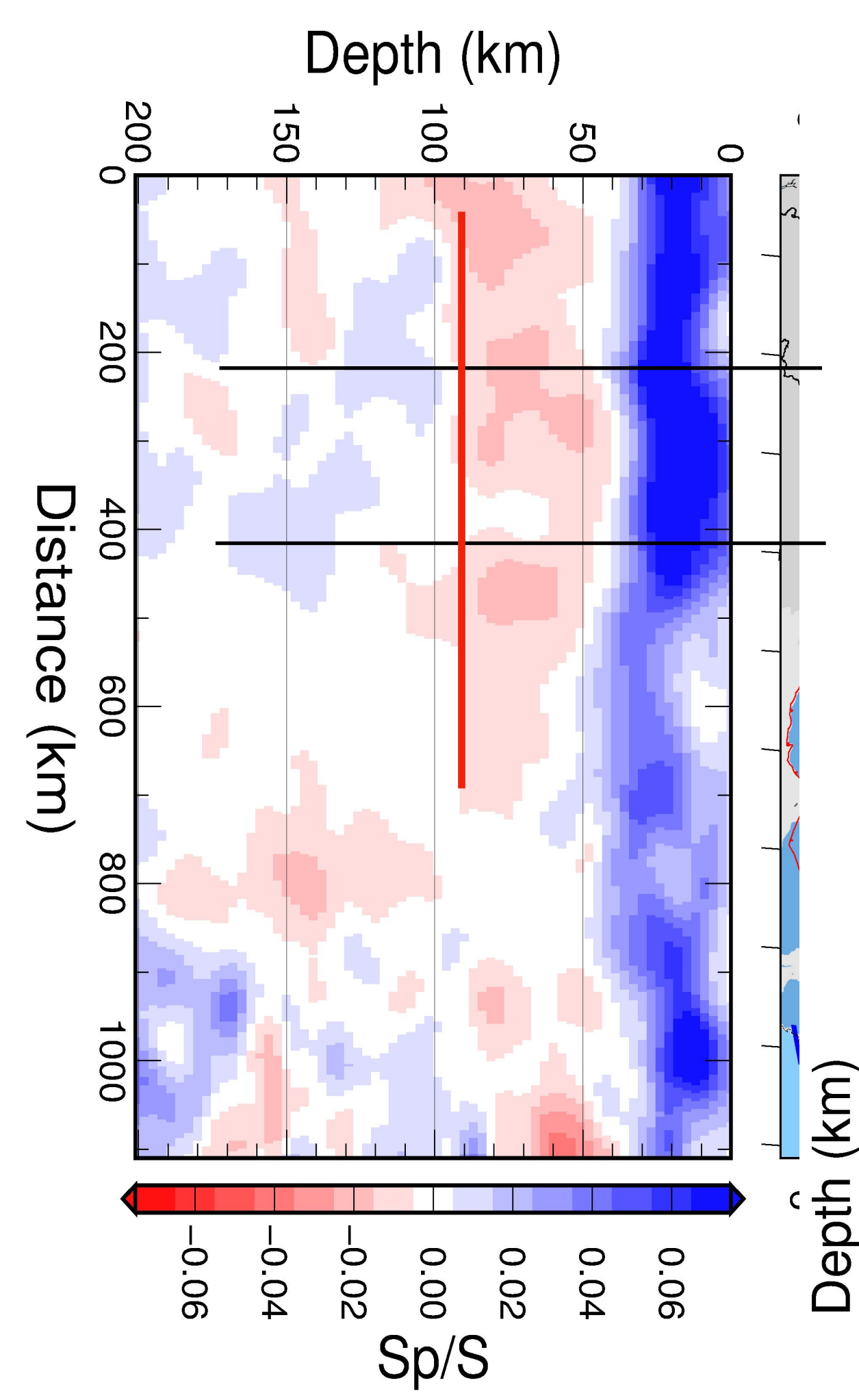


Lithospheric eastward  
thickening east of 10°E

PS\_missec-s-12.bin 47 4 47 18 100 4

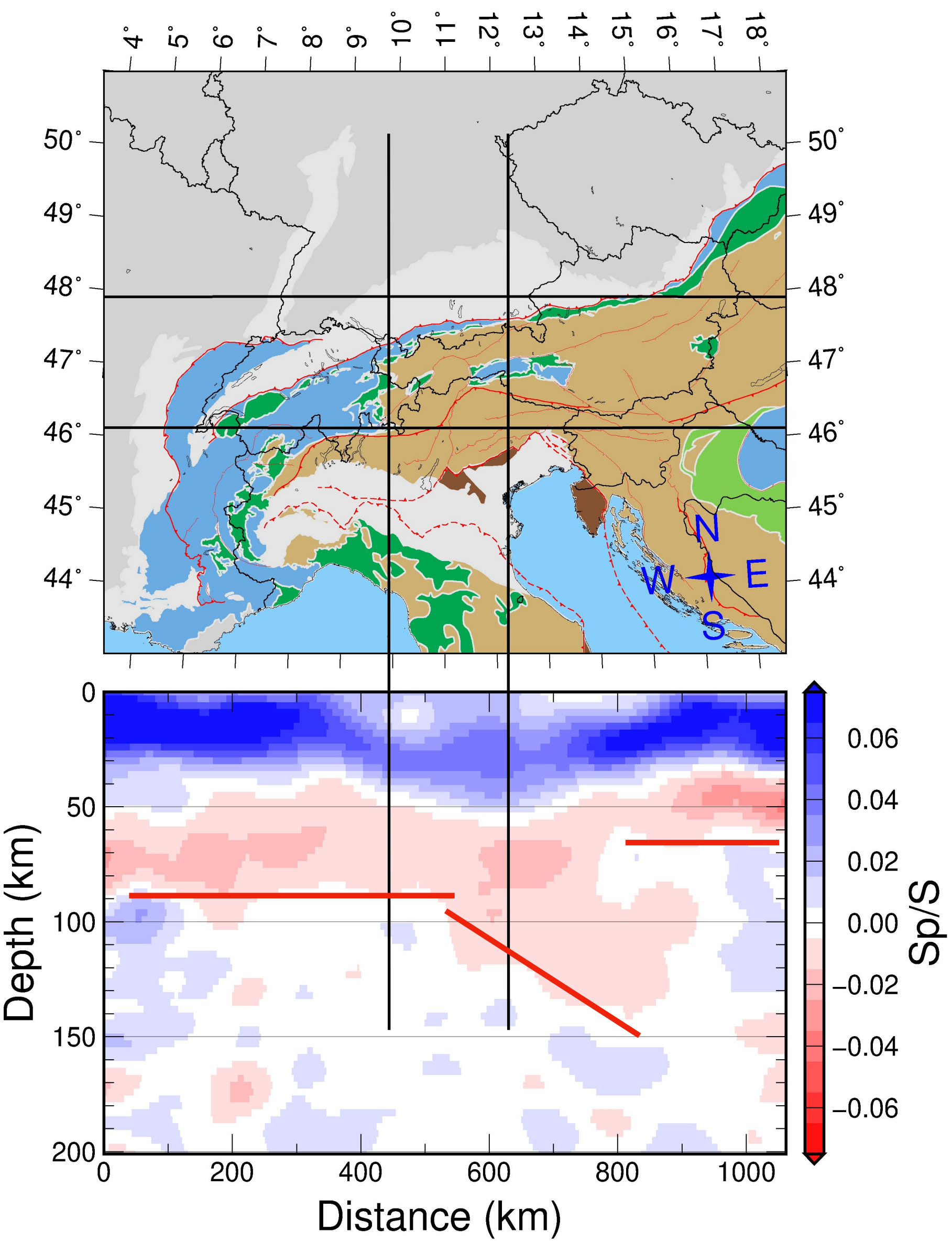


PS\_missec-s-12.bin 52 11 42 11 100 4

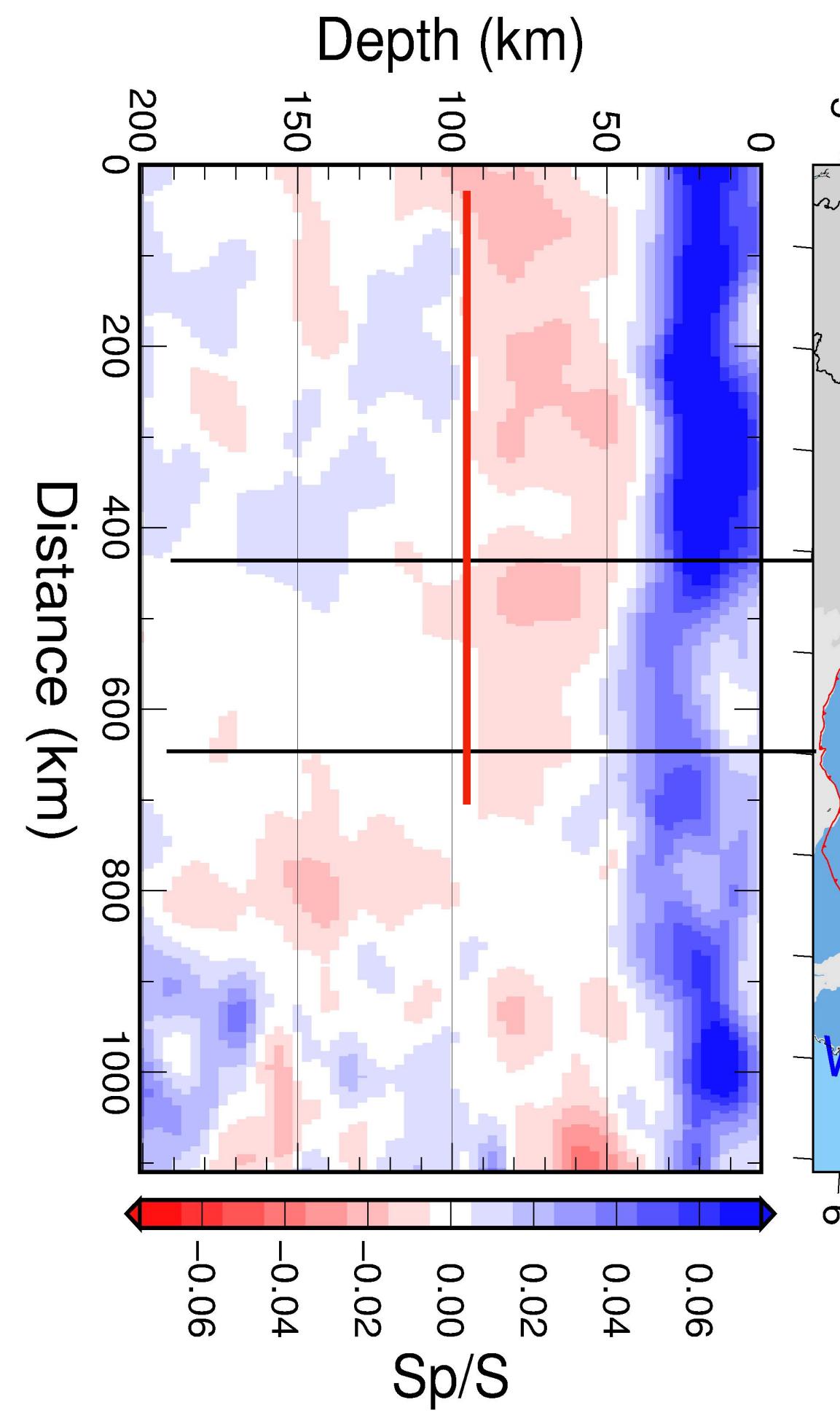


PS\_missec-s-12.bin 49 4 49 18 100 4





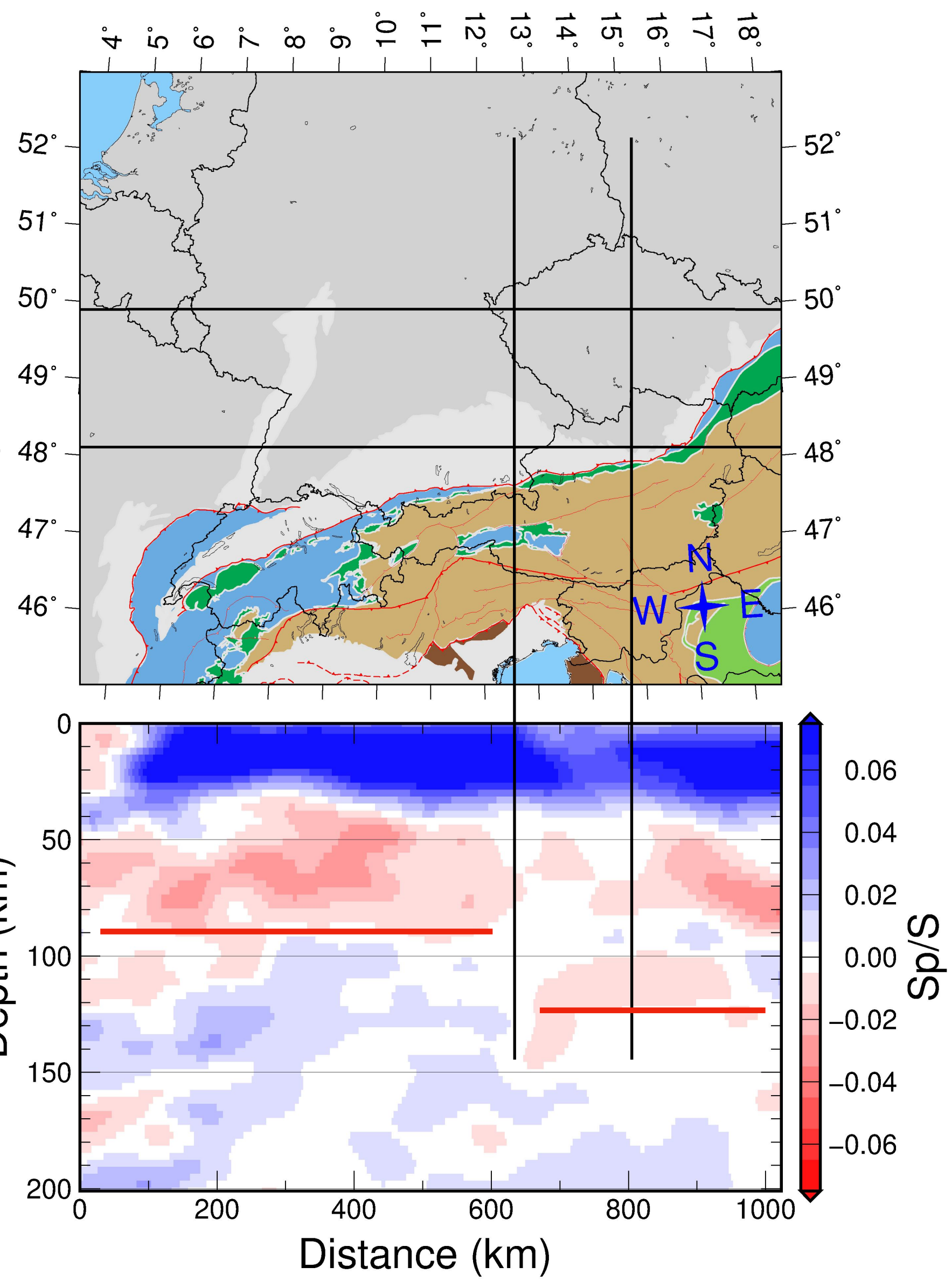
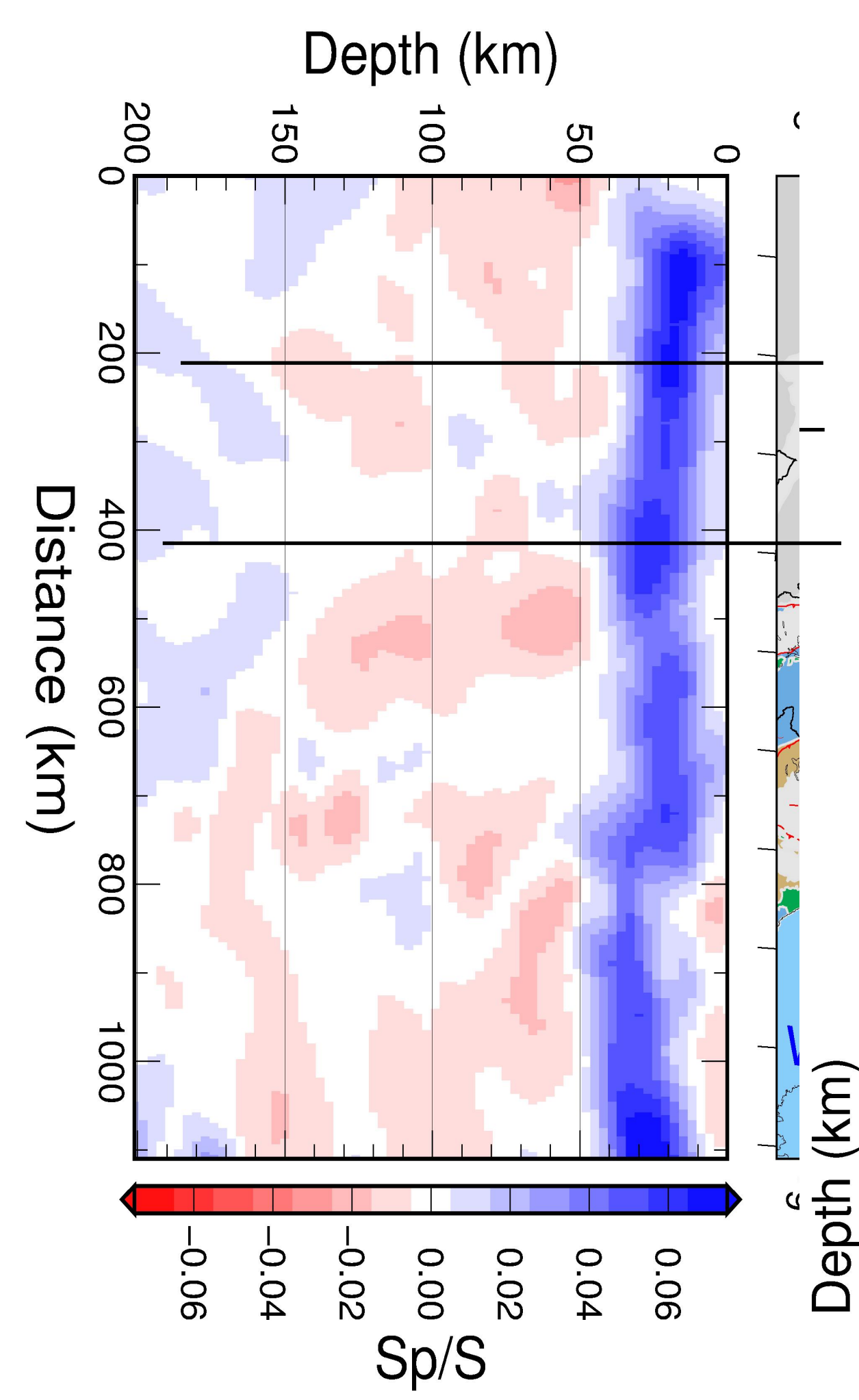
PS\_missec-s-12.bin 47 4 47 18 100 4



PS\_missec-s-12.bin 52 11 42 11 100 4



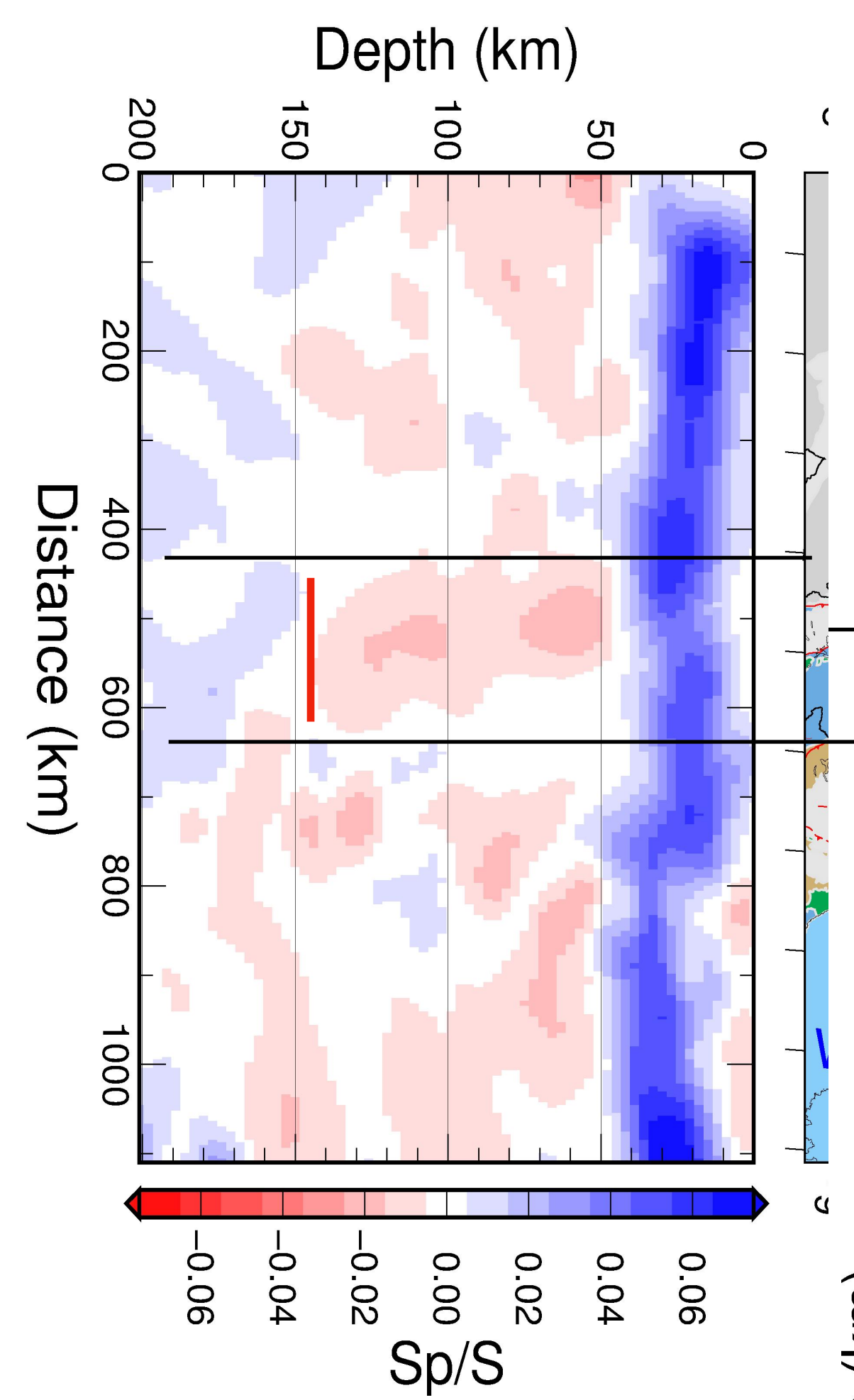
PS\_missec-s-12.bin 52 14 42 14 100 4



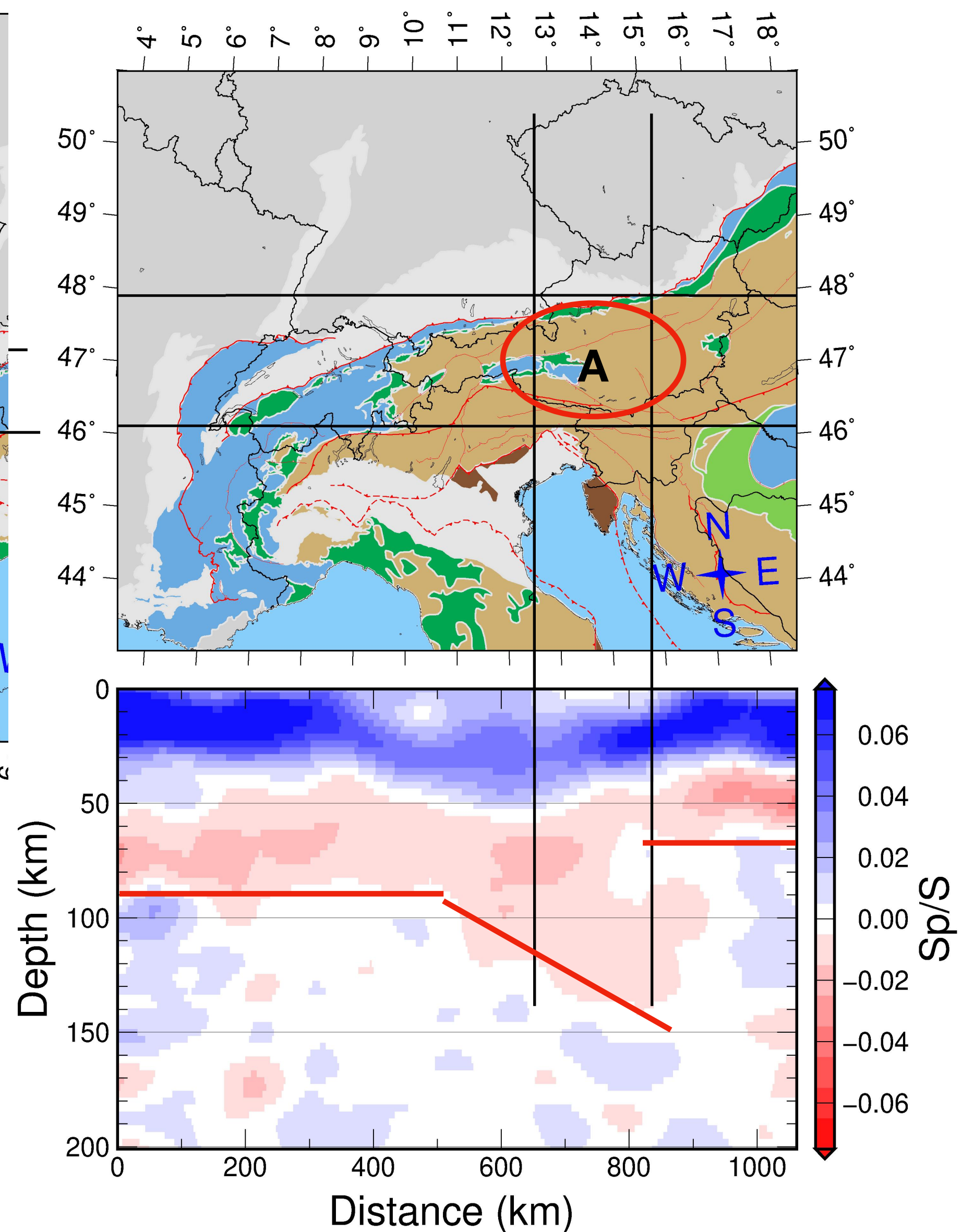
PS\_missec-s-12.bin 49 4 49 18 100 4



PS\_missec-s-12.bin 52 14 42 14 100 4



**A** is the location of the deepest part of the Adriatic slab in Lippitsch et al. (2003), see Fig.3



PS\_missec-s-12.bin 47 4 47 18 100 4



# Summary of seismic observations of the lithospheric structure below the Alpine area with Ps and Sp converted waves

Moho observations agree mostly reasonably well with known results. The Dinarides Moho is reaching to the Tauern Window, where it reaches a larger depth than the European Moho (Fig.6).

There is in the central Alps no indication of lithospheric subduction visible (see Lippitsch et al. 2003), only the Moho is dipping southward, the European mantle lithosphere remains at constant depth to the southern boundary of the Alps (Figs.5 and 8).

The lithosphere below the Bohemian Massiv is about 30km thicker than the west European lithosphere (Fig.8).

The lithosphere below the Alps is deepening to the east starting at about 10°E. It reaches its largest depth of about 140km east of the Tauern Window. This is very close to the place where Lippitsch et al. (2003) observe the Adriatic slab. East of about 15°E the thin lithosphere (about 60km) of the Pannonian Basin is observed (Figs. 7 and 13).