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A new tomographic subcrustal model of the Pyrenees

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A new tomographic model of the subcrustal structure of the Pyrenees is computed from teleseismic P and PKP data collected at about 110 permanent and temporary stations in the Pyrenees. Compared to the previous model of Souriau and Granet (*J.Geophys.Res.* 100, 1995), it benefits from a better station distribution and from a picking of arrival times on numerical records. The data set includes about 32000 paths. The inversion is made between 50 and 250 km depth, with a model divided into $0.25 \times 0.25^{\circ}$ blocks of 25 km thickness. Two models are derived: model 1 on raw data, model 2 on data corrected for crustal heterogeneities. These corrections mostly include the effect of the Moho jump along the North Pyrenean Fault (NPF), considered as the suture between the European and Iberian plates; this jump reaches 20 km in the central part of the range.

The level of subcrustal heterogeneities does not exceed 2%. The comparison of models 1 and 2 shows the drastic influence of crustal corrections. The two models are very different down to 100-125 km km, and become very similar below. In model 1, a smearing effect mimics a subduction, which is in fact an artefact due to the uncorrected Moho jump. Model 2 reveals short wavelength heterogeneities which are poorly correlated with the NPF, and which were hidden by the Moho jump signal in model 1. The main features are low P-velocity anomalies close to the Mediterranean down to 150 km, a prominent positive anomaly beneath Andorra down to at least 175 km, and slow velocities south of the NPF to the west beneath 100 km depth. An interpretation of these heterogeneities at the light of the Alpine and Hercynian tectonics will be attempted.