

# Global P velocity models and resolution analyses: increasing grid density

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We have quantified the fictitious coupling (trade-off) existing between the voxels of global tomographic images of P-velocity in the Earth's mantle (data from ISC bulletins). We have repeated this exercise for three different voxel-sizes and have analyzed the resolution of the different models so obtained. The result is that the quality and the coverage of our data set allows us to resolve seismic structures as small as  $3^\circ$  at least in some portions of the mantle. By means of a comparison with some recently published P-wave and S-wave models, we have verified that our  $3^\circ$  voxel model (VOX3P05) is effective in imaging large scale as well as small 'plume-like' seismic anomalies. Due to the choice of a proper regularization scheme (by means of the L-curve criterion), VOX3P05 is characterized by more pronounced velocity anomalies at the base of the mantle, where other models tend to be weaker. Since, due to the differences in data sampling, the model resolution can be quite variable throughout the mantle, the associated analysis of the resolution matrix is an indispensable tool to provide estimates of the reliability of our interpretations of the imaged seismic anomalies.

## References:

*Boschi L., Measures of resolution in global body wave tomography. Geoph. Res. Lett., 30, doi:10.1029/2003GL018222.*