Seismic Velocity Model of Crust and Upper Mantle beneath Central Andes (https://doi.org/10.5880/GFZ.2.4.2021.005)

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1. Licence

2. Citation

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3. Data Description

Regular spherical chunk mesh without considering the topography, ocean layer or explicitly meshed internal discontinuities. Mesh grid size in the lower mantle is around 40 km and 20 km in the upper mantle and crust.

The model is parameterized into velocities for vertically and horizontally propagating P waves (VPV and VPH) and vertically and horizontally polarised S waves (VSV and VSH) and density ρ.

The model is obtained through multi-scale full waveform inversion through spectral-element code (Salvus). More working details could be found in Gao et al. (2021). All seismic networks that are serving as input data for the tomography model are listed in the References section below.

4. File description

The following files are included in the data publication (folder 2021-005_Gao-Tilmann_modeldata/):

- file: **finalmodel.e**
  It is an exodus format file and could be visualised by paraview. We provide a jupyter notebook which could read the model file through pyexodus (https://salvushub.github.io/pyexodus/) and h5py python module.

- file**: modeldata.txt**
  As an alternative, more generic format, we provide an ASCII file (modeldata.txt). The collums correspond to lat(degree), Lon(degree), depth (km), vpv (m/s), vph(m/s) vsv(m/s) vsh(m/s) rho(kg/m3) x(m) y(m) z(m)
  which is better to be open through numpy.loadtxt (modeldata.txt) command, you could also visit the jupyter notebook to open the file and see the simple codes inside

- file: **datareading.ipynb**
  A jupyter notebook shows how the finalmodel.e is presented and read for more potential interactive actions from users.

- File: **2021-005_Gao-Tilmann_data-description.pdf**
  This document

4.1. Description of "modeldata.txt"

Column No.	variable	unit	Description
1	latitude	degree	Geographic latitude
2	longitude	degree	Geographic longitude
3	depth	km	Earth depth (positive from surface to depth)
4	vpv	m/s	Velocity of vertically propagating P waves
5	vph	m/s	Velocity of horizontally propagating P waves
6	vsv	m/s	Velocity of vertically polarised S waves
7	vsh	m/s	horizontally polarised S waves
8	rho	kg/m^3	density
9	x	m	Geocentric coordinate X
10	y	m	Geocentric coordinate Y
11	z	m	Geocentric coordinate Z

5. References – Seismic Networks (input data)

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