

EGU22-3554

<https://doi.org/10.5194/egusphere-egu22-3554>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Towards waveform seismic filtering of mantle convection models

Nobuaki Fuji¹, Nimit Dhabaria¹, Giacomo Roncoroni², Robert Myhill³, Stéphanie Durand⁴, Anselme Borgeaud⁵, Paul Tackley⁶, Takashi Nakagawa⁷, and Frédéric Deschamps⁵

¹Institut de physique du globe de Paris, Université de Paris, Paris, France (nobuaki@ipgp.fr)

²Geophysics, Università degli studi di Trieste, Trieste, Italy (groncoroni@units.it)

³Geophysics, University of Bristol, Bristol, UK (bob.myhill@bristol.ac.uk)

⁴Geophysics, ENS Lyon, Lyon, France (stephanie.durand@ens-lyon.fr)

⁵IES, Academia Sinica, Taipei, Taiwan (frederic@earth.sinica.edu.tw)

⁶Department of Earth Sciences, ETH Zurich, Zurich, Switzerland (ptackley@ethz.ch)

⁷School of Earth and Environment, University of Leeds, Leeds, UK (T.Nakagawa@leeds.ac.uk)

Earth science has been heavily data-driven due to the abundance in data. Yet, when there are relatively a small number of hypotheses to verify, the inverse problem becomes a classification problem. It is then worth directly examining observed seismic data against predicted data. Concretely, we chain forward modelling from geodynamics to seismology. We call this process ‘waveform Seismic Low Filtering of Earth’s models’ (SeLFiE). We take seismic signals of the snapshots of forwardly generated Earth models with that of the actual Earth, as if we took a photo of ourselves. Although there have several studies on how the seismological tomographic technique can perceive the geodynamical models, there are few studies on the seismic waveform sensitivity to geodynamical or petrological parameters. A pilot test of our *SeLFiE* methodology was encouraging, since we used only one seismic station to constrain the melt transportation manner beneath the Réunion island (Franken et al. 2020). Here in this contribution we present our strategy and developed tools towards the waveform filtering that have been developed during and after the CLEEDI week in August, 2020.