Imaging earth across scales with correlation wavefield

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Much of the effort over the past decade in the field of passive seismic imaging has focussed on using seismic ambient noise signals recorded simultaneously by seismic sensor networks, mainly utilising the surface wave component of the wavefield in seismic imaging. Meanwhile, some of the recent methodological developments enabled the use of body waves of the seismic correlation wavefield in earth imaging retrieved from the ambient seismic noise signals and also the scattered part of the earthquake signals.

I present some of the recent developments in the utilisation of the surface and body waves of the seismic correlation wavefield in earth imaging, using examples around the world including 4D monitoring of the earth. I also introduce a new interferometric wavefield reconstruction technique for improving the accuracy and volume of the measurements in earth imaging.

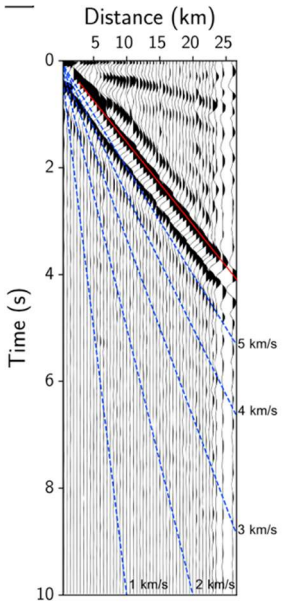

Figure 1. Extracted local body waves from the correlation of distant earthquake coda (Saygin & Kennett, 2019).

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References

Saygin, E., and B.L.N. Kennett, 2019, Retrieval of Interstation Local Body Waves from Teleseismic Coda Correlation: Journal of Geophysical Research-Solid Earth, doi:10.1029/2018JB016837.