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Radial anisotropy in the crust beneath the Netherlands from ambient seismic noise

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Ambient seismic noise interferometry has become a common tool to study the crust and uppermost mantle. The approach is based on the ability to extract the Green's function between two receivers from the cross-correlation of their ambient noise recordings. With surface waves being the dominant signal of these cross-correlations, surface wave dispersion is most readily determined from these data.
Interstation Rayleigh and Love wave group velocity curves were measured from noise data of 19 stations of the NARS-Netherlands project (2008-2012) complemented with 12 stations from the Royal Netherlands Meteorological Institute, the German Regional Seismograph Network, and the Belgian Seismic Network. From these measurements Rayleigh and Love wave group velocity maps were constructed for the period range of 10 to 30 s. The variations in these group velocity maps primarily reflect variations in sedimentary thickness across the Netherlands.
To investigate the presence of radial anisotropy (transverse isotropy with a vertical symmetry axis) of the crustal shear velocity structure, the average Rayleigh and Love wave group velocity curves for the Netherlands were inverted using the Neighbourhood Algorithm (Sambridge, 1999). The Neighbourhood Algorithm searches the parameter space and then evaluates the ensemble of models using a Bayesian approach. The results show evidence of strong positive (Vsh > Vsv) upper crustal anisotropy with up to 20% anisotropy for the best-fitting models, and slight, but significant, negative anisotropy in the lower crust. Radial anisotropy in the uppermost sedimentary layer is only poorly resolved, but the data suggest that Vsh > Vsv.
We will invert the group velocity maps for the 3-D radially anisotropic shear-velocity structure beneath the Netherlands and results and interpretation will be presented at the meeting.