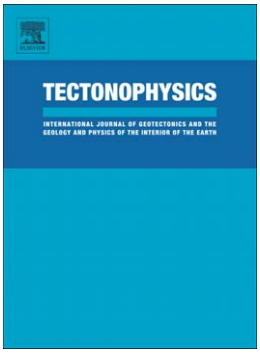


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# The crustal structure beneath the Netherlands derived from ambient seismic noise

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**Abstract**

This work presents the first comprehensive 3-D model of the crust beneath the Netherlands. To obtain this model, we designed the NARS-Netherlands project, a dense deployment of broadband stations in the area. Rayleigh and Love wave group velocity dispersion was measured from ambient noise cross-correlations. Azimuthally anisotropic group velocity maps were then constructed and the isotropic part was used to determine a shear wave speed model that includes the effects of radial anisotropy. Employing the Neighbourhood Algorithm for the depth inversion, we obtained probabilistic estimates of the radially anisotropic model parameters. We found that the variations in the thickness of the top layer largely match the transition from sediments of Permian age to those of Carboniferous age. Regions of high faulting density such as the West Netherlands Basin and Roer Valley Graben are recognized in our model by their negative radial anisotropy ($V_{SH} - V_{SV} < 0$). The model has a mid-crustal discontinuity at a depth of around 13 km and

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