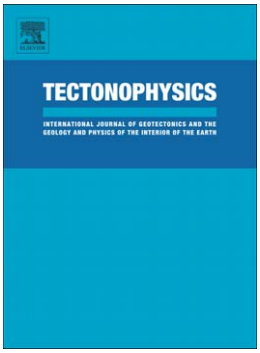

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PII: S0040-1951(16)30631-X
DOI: doi:10.1016/j.tecto.2016.12.018
Reference: TECTO 127361

To appear in: *Tectonophysics*

Received date: 7 July 2016
Revised date: 13 December 2016
Accepted date: 18 December 2016

Please cite this article as: Ojo, Adebayo Oluwaseun, Ni, Sidao, Li, Zhiwei, Crustal Radial Anisotropy beneath Cameroon from Ambient Noise Tomography, *Tectonophysics* (2016), doi:10.1016/j.tecto.2016.12.018

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ABSTRACT

To increase the understanding of crustal deformation and crustal flow patterns due to tectonic processes in Cameroon, we study the lateral variability of the crustal isotropic velocity and radial anisotropy estimated using Ambient Noise Tomography (ANT). Rayleigh and Love wave Noise Correlation Functions (NCFs) were retrieved from the cross-correlation of seismic ambient noise data recorded in Cameroon, and phase velocities at periods of 8 to 30 s were measured to perform surface wave tomography. Joint inversion of Rayleigh and Love wave data for isotropic velocity models could not fit the observed dispersions simultaneously. We attribute the Love-Rayleigh discrepancy to the presence of radial anisotropy in the crust and estimated its magnitude. Our 3-D radial anisotropic model reveals the spatial variation of strong to weak positive (Vsh > Vsv) and negative (Vsv > Vsh) radial anisotropy in the crust. We observe negative radial anisotropy in the upper crust that is associated mainly with the location of a previously reported mantle plume. The anisotropy could be attributed to the vertical alignment of fossil microcracks or metamorphic foliations due to the upwelling of plume material. A strong positive radial anisotropy is centered at the location of an inferred boundary between the Congo Craton and the Oubanguides Belt that might be related to the preferred orientation of crustal anisotropic minerals associated with shearing in this fault zone. The middle crust is characterized by a widespread negative radial anisotropy that is likely caused by the flow-induced alignment of anisotropic minerals that crystallized during magma intrusion. The magnitude of the radial anisotropy varies systematically from predominantly negative in the middle crust to positive in the lower crust. The imaged patterns of the isotropic velocity and radial anisotropy are consistent with previous studies and agree with regional tectonics.

Keywords: Crustal Radial Anisotropy, Ambient Noise Tomography, Cameroon, Crustal Deformation