**Lateral Variations of Seismic Anisotropy in the Caucasus Region of West Asia**

**西亞高加索地區震波非均向性之側向變化**

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The Caucasus in west Asia is a natural laboratory to study dynamics of continental collision between Arabian and Eurasian Plates that initiated ~25 Ma. The new seismic arrays in Armenia and Georgia provided unique opportunity to constrain seismic anisotropy in great details beneath the region and further explore the relationship between asthenosphere and lithosphere associated with post-collisional volcanisms.

In this study, we use the shear-wave splitting (SWS) of SK(K)S phases to estimate the fast-direction and delay time resulted from seismic anisotropy under each station for events recorded during 2010-2020. Moreover, we apply principal components analysis to improve our SWS measurement on accessing linearity of particle motion. Totally, we accomplish 46 stations and 1346 high-quality measurements of SWS to map out the lateral variation of S anisotropy below the study area. The variation along depth, although difficult to constrain, is also investigated with 1-D forward modeling (of two-layer anisotropy with different thickness and strength of anisotropy).

The results of SWS indicate that the fast-directions of the region primarily show NE-SW orientation which is subparallel with the absolute plate motion. However, the delay time decreases significantly from 1.06 s for stations in western Caucasus to nearly 0.70 s in southeastern Caucasus where Quaternary-Holocene volcanoes are still active in Armenia. We propose that the prevailing NE-SW seismic anisotropy represent large-scale asthenospheric flow in the Caucasus-Anatolia region; while the significant change in split time may be disturbed by mantle up-well of small-scale convections right under the thinned lithosphere associated with post-collisional volcanoes.

**Keywords:** Caucasus, seismic anisotropy, shear-wave splitting, asthenosphere

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