Crustal and Uppermost Mantle Structure Across Central Myanmar by Joint Analysis of Receiver Functions and Rayleigh-wave Dispersion

Yiming Bai$^{1,2}$, Yumei He$^{1,3}$, Xiaohui Yuan$^2$, Myo Thant$^4$, Kyaing Sein$^5$, and Yinshuang Ai$^{1,3}$

$^1$Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China (baymax@mail.iggcas.ac.cn)
$^2$DeutschesGeoForschungsZentrum GFZ, Potsdam, Germany
$^3$CAS Center for Excellence in Tibetan Plateau Earth Sciences, Beijing, China
$^4$Department of Geology, University of Yangon, Yangon, Myanmar
$^5$Myanmar Geosciences Society, Yangon, Myanmar

The territory of Myanmar, situated at the eastern flank of the India-Asia collision zone, is characterized by complex tectonic structure and high seismicity. From west to east, this region consists of three nearly NS-trending tectonic units: the Indo-Burma Ranges, the Central Basin and the Shan Plateau. Detailed structure of the crust and uppermost mantle beneath Myanmar can provide crucial constraints on regional tectonics, subduction dynamics as well as seismic hazard assessment. Yet seismic velocity structure beneath this region is poorly determined due to sparse regional seismic networks.

In this study, we utilize seismic data recorded at 80 broadband stations in Myanmar, among which 70 stations were deployed in 2016 under the project of China-Myanmar Geophysical Survey in the Myanmar Orogen (CMGSMO), 9 stations are operated by IRIS and the remaining one is from GEOFON. We measured the Rayleigh-wave phase velocity dispersion from the ambient noise cross-correlations at periods between 5 s and 40 s by using the automatic frequency-time analysis (AFTAN). A fast marching surface wave tomography (FMST) approach was then adopted to invert the 2-D phase velocity maps in the study region. Our preliminary results show variable crustal structure across central Myanmar, with a strong low-velocity zone north of 22°N in the Indo-Burma Ranges. Since Rayleigh-wave dispersion is more sensitive to absolute velocity speed than to velocity contrasts, the ongoing study jointly inverts the dispersion data with P-wave receiver functions to better determine the velocity discontinuities and thus provides tighter constraints on the shear-velocity structure beneath central Myanmar.