

# Northern Thailand velocity structure from azimuthal tele-seismic receiver function studies

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Northern Thailand (NT) can be classified as the earthquake prone area, there are many active faults cutting through the area. The largest earthquake in Thailand modern history was also occurred on one of the active fault zones in the area on May 5th, 2014. In order to correctly estimate the epicenter and magnitude of the local earthquake, seismic velocity profile of the area is necessary which can be estimated from the receiver function (RF) studies. In this study, during period of this study January 2011 – August 2014, seismic data recorded by ten seismic stations in the northern Thailand were used to calculate receiver function time series. Earthquake sources in this study incident crustal layers from different directions respect to source location e.g. Japan, New Zealand, Papua New Guinea and a few from Europe. Receiver function for each station then processed in two different schemes. First, for each station, all receiver functions were processed together to produce crustal thickness and velocity structure beneath the seismic stations. Second, the tele-seismic waveforms were azimuthally classified according to its origin before processing to yield azimuthal RFs. Then Azimuthal RFs were used to estimate crustal thickness and velocity structures for each azimuth. The results reveal that both all RFs and azimuthal RFs yield similar result that crustal thickness increasing from 32 km in western part to about 40 km to the eastern part of NT. But ,there are two station, CMMT and LAMP, Chiangmai and Lampang province respectively, that present crustal thickness from azimuthal RFs is greater than that of all RFs about 1 km. Low velocity layer (LVL) can be observed with the waveform analysis. This LVL was supported by inversion of all RFs and azimuthal RFs which consistency provide the LVL at depth about 10 to 16 km at Mae Hong Son province and deeper at the depth about 16 to 24 km from Lampang province to Phitsanulok province.

Keyword : earthquake, receiver function, tele-seismic, azimuthal, low velocity layer

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