

## **A 1D Velocity Model of Thailand (Preliminary results, Northern Thailand)**

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### **Abstract**

The earthquakes in Thailand and adjacent areas have been monitored by the earthquake observation division, Thai Meteorological Department (TMD). The earthquake location was calculated by using a global velocity model IASP91. The earthquake location mainly depends on the accuracy of predicted travel-times and crust and mantle velocity structure. Therefore, an appropriate regional velocity model was required to improve the earthquake location accuracy. This study aims to develop a 1D velocity model used for local epicenter location calculation.

A total of 156 earthquakes were selected based on azimuthal gap, minimum number of stations, and root mean square travel-time residuals that have similar criteria as the work of Shiddiqi, et al. (2019). The VELEST program was used to obtain the 1D seismic velocity model. After testing the layer thickness of IASP91 model, the 2 km grid size and 32 km crustal thickness of northern Thailand were used for all 6 initial models. The 6 initial models were tested to obtain the best 1D velocity model, called NTh1D model. The NTh1D model shows a more accurate hypocenter solution compared with the original IASP91 and other models tested in this study. The station corrections were also reported to produce better earthquake locations. However, to improve the velocity model, more earthquake stations and earthquake events must be increased. The 3D velocity model is also great for earthquake location improvement.

**Keywords:** velest, velocity model, earthquake epicenter