



Subsurface Structure Investigation of Southern Longitudinal Valley, Taiwan from Seismic Reflection Data

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The 150km long Longitudinal Valley (LV) in eastern Taiwan is located at the suture zone of Eurasian and Philippine Sea Plate, connecting two subduction systems in northeastern and southern Taiwan. In this area, considerable seismicity as well as crustal deformation are accommodated by the Longitudinal Valley fault system (LVF), which is mainly composed of high angle east-dipping thrust faults.

To better understand the subsurface structure and the fault geometry of the southern LV, we conducted shallow seismic reflection survey across the LVF from Donli to Luyeh in 2017. Totally, there are four 4-km-long seismic reflection profiles. We used two mini vibroseis trucks with sweeping frequencies from 35-200Hz as sources and the common-midpoint spacing is 2.5m with maximum 30 folds. A strong east-dipping reflector relative to the bedrock reflection down to 1.5km deep can be observed after noise suppression. Some low reflectivity zones in the east side of the profiles could be related to the muddy Lichi mélange. It is interesting to note that in the eastern Luyeh profile, the syncline with the east-dipping axis implies the Lichi segment of the LVF and the orientation of the tectonic deformation. As a result, the southern LV displays an asymmetric sedimentary basin pattern with a deeper bedrock to the east.