

Figure 1. Map and cross sections of earthquake locations in central Taiwan. Section in lower left shows all earthquakes. In other sections, different colors indicate events belonging to different faults, selected in three dimensions; in particular, pink refers to earthquakes of interpreted main detachment, and black refers to earthquakes not assigned to any planar structure. Black boxes on map indicate location of events projected onto each section. Some scattering of events in cross section is due to distortion inherent in projecting a three-dimensional structure onto two-dimensional plane.

er events (Carena and Suppe, 2002). Therefore abundant low-magnitude mechanisms are required for a convincing test. Nevertheless, the detachment interpretation is supported by the observation that other planes of seismicity that exist above and below the inferred detachment but it does not crosscut it (Fig. 1, where three-dimensional fault-like planar subsets of earthquakes are shown in different colors). A very similar distribution of earthquakes was seen locally in data from a temporary seismic network placed to record aftershocks of the Chi-Chi earthquake, including a well-defined horizontal plane of events at ~10 km depth (Nagai et al., 2001). Therefore we proceed with the hypothesis that the seismicity is emitted from the main detachment and

its surrounding zone of deformation. In a following section we see that the observed geometry is consistent with critical-taper wedge mechanics.

The inferred main detachment beneath the Taiwan mountains is subhorizontal and at an average depth of 10–15 km under most of west-central Taiwan, but it dives steeply down under eastern Taiwan (Figs. 3 and 5; video of topography of Taiwan, see footnote one). The maximum depth at which it can be recognized because of abundant earthquakes is 50 km at the northern end of the examined area and 35 km at the southern end. The surface becomes progressively steeper

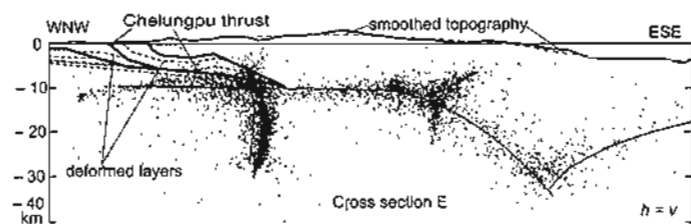


Figure 2. Cross section showing projected earthquakes together with fault traces obtained from three-dimensional surfaces (in gray, below 10 km depth) and structures obtained from surface geology, seismic reflection profiles, and wells (in black, above 10 km depth). (See Fig. 1 for location.)

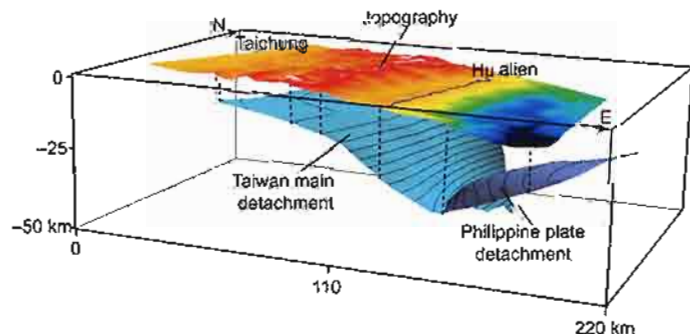


Figure 3. View of three-dimensional spatial relationship between topography and main detachment.