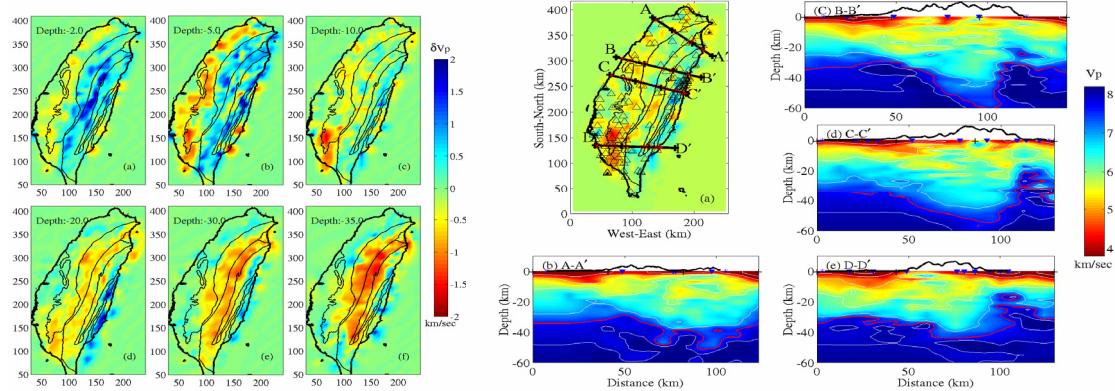


Recent Research Results: Jer-Ming Chiu

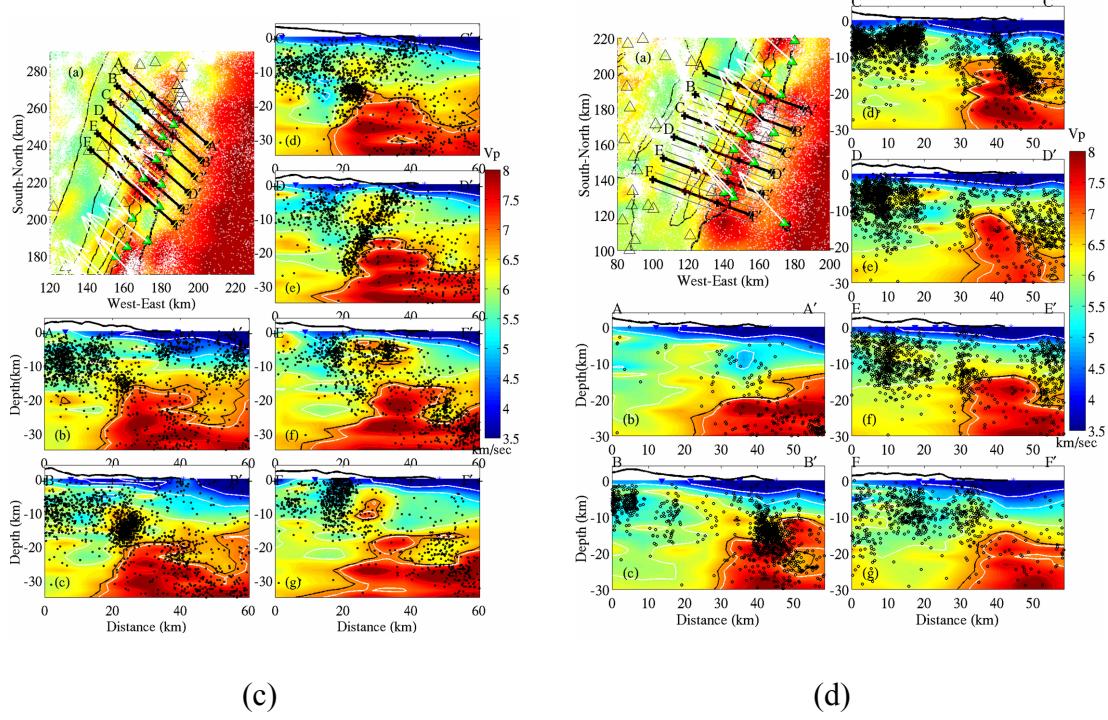
(2) A new tectonic model for the orogenic process in the Taiwan region – (a paper in preparation)

Summary: Along one of the fastest converging plate boundary on the earth, numerous earthquakes occurred as a consequence of young and active mountain building processes in the Taiwan region. A few tectonic models have been proposed to interpret the orogenic process in the Taiwan region based on seismic profiles, surface geologic data, results from modern seismic tomographic inversions and earthquake relocations, and the 1999 Chi-Chi earthquake sequence, etc. Recently, we have determined, probably, the first comprehensive 3-D Vp and Vs structural models beneath the Taiwan region by considering the very significant lateral structural variations of the upper crust in the initial 3-D models, as evidence from surface geology and topographic information. Also, it is evident that the north-south trending collision zone between the Philippine Sea and Eurasia plates is characterized by a relative thin crust (~23 km) and elevated high-velocity oceanic upper mantle. A new tectonic model is proposed to interpret the deformation of the continental and oceanic crust, and thermal affect from the collision zone to the mid-to-lower crust beneath the continental crust.



(a)

(b)



(c)

(d)

Figure. (a) Horizontally thin-sliced Vp structure from shallow to deep depth showing the high velocity Central Range in the upper crust becomes low velocity region in the mid to lower crust, (b) a few cross-sectional views of Vp structure in the Taiwan region showing that deep root can be associated with the high mountains, (c) a few cross-sectional views of Vp and seismicity beneath the northern collision zone suture showing high-angle west dipping active fault and thin crust (or elevated high velocity oceanic upper mantle), and (d) similar to (c) for the southern collision zone.