

# **DEEP AND SHALLOW STRUCTURE OF TAIWAN ARC-CONTINENT COLLISION**

**SUPPE, John; WU, Yih-Min**

Dept. of Geosciences, National Taiwan University, Taipei, Taiwan

**CARENA, Sara**

Dept. of Earth and Environmental Sciences, University of Munich, Germany

**USTASZEWSKI, Kamil**

Lithosphere Dynamics, GFZ, Potsdam, Germany

The on-going oblique arc-continent collision in Taiwan between the Luzon arc and the Eurasian continental margin provides a classic spatial view of the temporal evolution of the collision. In addition Taiwan is a well-known site of critical-taper wedge mechanics and erosional forcing of deformation, leading to a mountain belt that is approximately in topographic steady state, with erosion balancing the compressive flux. This classic picture, based largely on surface and upper-crustal data, is now being illuminated at lower crustal and upper mantle levels with high-resolution local seismic tomography and earthquake locations. These new data document in 3D that the deep structure is remarkably independent of the shallow thinned-skinned mountain belt. Here we show that the lower crust and upper mantle of the Eurasian plate undergoes a transition from normal subduction and accretionary-wedge tectonics south of Taiwan to a strongly localized progressively bent geometry with a vertical to overturned plate interface. The lower crust and Moho of the Eurasian plate is vertical to overturned to depths of 70-80 km under central and northern Taiwan. In this region the deep plate shortening is accomplished by folding of both the Eurasian and Philippine-Sea lower lithospheres without an active subduction zone, whereas the crust of both plates above the main detachment is mechanically and kinematically separated from this deep shortening.