



Subduction-continent collision in southwestern Taiwan: the 2010 Jiashian earthquake sequence

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We integrated tomography model, seismicity and earthquake focal mechanisms of the 4 March 2010 ML 6.4 Jiashian earthquake source region to understand the seismogenic structure and mechanics of a rare damaging inland earthquake occurred in southwestern fold-and-thrust belt of Taiwan. The ML 6.4 Jiashian earthquake with a sinistral thrust mechanism, occurred at depth of 23 km beneath the slate belt of the southern Central Range. Based on seismic tomography and seismicity, the Jiashian earthquake sequence occurred at the transition zone between the subducted Eurasian plate to the south and the arc-continent Taiwan collision to the north. The distribution of the Jiashian aftershocks striking WNW-ESE with a dip of 30-40° to the NNE is consistent with the fault plane of the GPS-derived coseismic slip model. Focal mechanisms and inverted stress of the Jiashian earthquake sequence indicate thrust and strike-slip motions with the maximum compressive stress sub-parallel to the strike of the Taiwan orogen. We proposed that the 2010 Jiashian earthquake is resulted from rupturing of a buried oblique transfer fault at the subduction-collision transition zone in southern Taiwan. The orogen-parallel compression represents the collision-related lateral compression mechanism resulting from slip partition at the subduction-continent collision with about 35° moderate convergence obliquity in southwestern Taiwan.