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# Indentation tectonics in northern Taiwan: insights from field observations and analog models

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In northern Taiwan, contraction, extension, transcurrent shearing, and block rotation are four major tectonic deformation mechanisms involved in the progressive deformation of this arcuate mountain belt. The recent evolution of the orogen is controlled not only by the oblique convergence between the Eurasian plate and the Philippine Sea plate but also by the corner shape of the plate boundary. Based on field observations, analyses, geophysical data (mostly GPS) and results of experimental models, we interpret the curved shape of northern Taiwan as a result of contractional deformation (involving imbricate thrusting and folding, backthrusting and backfolding). The subsequent horizontal and vertical extrusion, combined with increasing transcurrent & rotational deformation (bookshelf-type strike-slip faulting and block rotation) induced transcurrent/ rotational extrusion and extrusion related extensional deformation. A special type of extrusional folds characterizes that complex deformation regime. The tectonics in northern Taiwan reflects a single, regional pattern of deformation. The crescent-shaped mountain belt develops in response to oblique indentation by an asymmetric wedge indenter, retreat of Ryukyu trench and opening of the Okinawa trough. Three sets of analog sandbox models are presented to illustrate the development of tectonic structures and their kinematic evolution