A tale of two sutures: From neotectonic characteristics to an alternative model for the tectonic evolution of Taiwan

由新構造運動特性重新探討台灣之大地構造演化

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Taiwan's numerous active faults and folds demarcate distinct eastern and western neotectonic belts. In the southern part of the orogen, both belts are in the final stage of consuming oceanic crust. Collision and suturing occur in the middle part of both belts, and post-collisional collapse and extension dominate the island's northern and northeastern flanks. Both belts consist of several distinct neotectonic domains. Seven domains – Kaoping, Chiayi, Taichung, Miaoli, Hsinchu, Ilan and Taipei – constitute the western belt, and four domains – Lutao-Lanyu, Taitung, Hualien and Ryukyu – make up the eastern belt. Each domain is defined by a distinct suite of active structures. In most of the domains, the size of the principal active fault is large enough to produce future earthquakes with magnitudes in the mid 7 ranges. The western neotectonic belt results from the attachment and subsequent detachment of a sliver of continental lithosphere to the Eurasian continental margin. The eastern belt is the product of the same continental sliver docking with and then separating from the Luzon volcanic arc. Thus, the active Taiwan orogen can be viewed as a tandem suturing and tandem disengagement of a volcanic arc and a continental sliver to and from the Eurasian continental margin. This progressive suturing and separation is a superb, living demonstration of the fundamental weakness of lithospheric sutures.