

Insights from a revised global compilation of the kinematics of subduction zones? Focus on the Philippines-Taiwan-Ryukyus region

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Unlike spreading ridges or transform faults, subduction zones are often the site of distributed or localized deformation up to several hundred kilometers from the plate boundary. Taking the "arc sliver zone" deformation into account enables a more accurate estimate of the effective long-term slip velocities (modulus, azimuth) on the subduction interface, which is useful for seismic hazard assessment or to estimate material flow transiting towards the mantle, for example. Characterizing this deformation also gives valuable information on the mechanical interactions between the subducting and overriding plates. From our recent update of a kinematic database (part of submap.fr database), integrating the motion of the arc slivers in the vicinity of subduction zones, we expanded previous studies and we more robustly predict a good correlation between the direction of across-arc deformation and the dip of the subducting slab. The region around Taiwan records numerous block rotations or sliver translations in response to a series of forcings that may combine, such as the transition from oceanic subduction to arc-continent collision, a 3D dynamic lithosphere-mantle interaction at the junction between 2 orthogonal subductions, or a marked convergence obliquity. We will see to what extent the deformation observed from the northern Philippines to the southern Ryukyus is consistent with that observed in other regions. Tentatively, we will attempt to shed some light on the mechanisms involved.

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