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Late tectonic uplift of an inverted oceanic basin in South East Asia: the case of Palawan Island (western Philippines)

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The elongated island of Palawan, bounded by two marginal basins, the South China Sea to the North and the Sulu Sea to the South is composed of remnants of an inverted basin (Proto-South China Sea) thrusted onto the margin of a continental terrane which rifted away from the Chinese-Vietnamese margin. Based on field observations coupled with seismic and drill-holes data, our study focuses on the structural architecture of the island in order to decipher the geodynamic evolution of the southern margin of the South China Sea.
Structurally, the Palawan Island consists of: (i) the Palawan wedge, which extends towards the South China Sea is composed of deformed slope to deep ocean deposits of Cretaceous (north Palawan) to Tertiary (central and south Palawan) ages. This accretionnary wedge is characterized by small wavelength folds of mainly NE-SW trend. Offshore, the unconformable Middle-Late Miocene Tabon limestones unit postdates the last stages of the Palawan wedge growth/setting; (ii) On top of this wedge lie thrust slices of ophiolite bodies comprising ribbon cherts of Albian age as indicated by radiolarians.; these bodies are likely to be relicts of the now-subducted Proto South China Sea; (iii) The central and southern parts of the Palawan island are characterized by a large wavelength antiform of NE-SW trend. This structure is sealed by the slightly tilted Early Pliocene marls unit; (iv) The island also presents necking zones bordered by N-S trending transform faults.
This area witnessed the geodynamic evolution of the South East Asia which consists of a succession of opening/closure of oceanic basins and block accretions. The Palawan Island therefore results of the closing of the Proto-South China Sea which once formed both the Palawan accretionary wedge and the overlying ophiolite tectonic slices. During a later compressive event, the rifted continental margin which composes the basement of the Island was inverted, inducing the uplift and the large scale folding of the Palawan Island. In a final stage, the strain relaxing results in the formation of the necking zones, probably reactivating the inherited transform faults of the Proto-South China Sea.

Keywords: Palawan Island; South China Sea; oceanic basin; inverted margin; Ophiolite.