



Tectonics of the Central Sunda margin accretionary prism off western Java

D. Hindle (1), D. Klaeschen (1), H. Kopp (1)

(1) IfM Geomar, Ab. Geodynamik, Geb. Ostufer, Wischofstr. 1-3, 24148 Kiel, Germany

The Central Sunda margin is the product of an active subduction system since the middle Tertiary, and has been apparently mostly accretionary throughout this time. At the present day, up to 20 km of sediment sit in the trench, forming a classical segmented accretionary system. An active accretionary front is abutted against a transient backstop region composed of Eocene-Oligocene material with fossil accretionary structures, which forms an outer forearc high, and is in turn bordered by a forearc basin.

Depth migration of a seismic line from offshore western Java reveals the details of both fossil accretionary structures and the active frontal duplex, as well as recent transpressive and transtensional tectonics affecting both fossil prism and forearc. The latter structures are suggested to be related to motion at the tip of the West Sumatra - Mentawi fault system. A subduction channel of 1-2 km thickness can also be identified along considerable length of the top of the downgoing plate, and allows some inferences about the degree of accretion versus erosion over time.

Numerical models of the accretionary system using the distinct element technique allow the process of accretion leading to outer forearc high and fossil prism and relatively undeformed adjacent forearc basin to be studied. Using time-dependent strengthening of sediments also allows realistic simulation of localisation of deformation into thrusts and duplexes. The geometry of deformation appears mainly influenced by the two basal angles imposed on the model by the forms of the tops of downgoing and overriding plates. Control of geometry of the two bases by flexure induced by sediment loading may thus also create a feedback governing the accretionary geometry of the margin.