



## **Sundaarc subduction zone: new insights of the Central Java part**

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The eastern Sunda margin off Indonesia remains a little investigated subduction zone, contrary to its well-studied northwestern segment.

Along the Central Java segment of the Sundaarc the oceanic crust convergences at a rate of 6,7 cm/yr in a direction N11°E and is approximately orthogonal to the trench. At present, 135 Ma year old oceanic crust subducts off eastern Java and crustal ages decrease to 96 Ma years off western Java and southern Sumatra.

A continuous accretionary wedge, outer forearc high and forearc basin, as recognized along the Sunda margin off Sumatra and western Java, are not developed further east in the study area off Central Java. A large scale uplift and segmentation of the forearc due to subduction of oceanic basement relief leads to isolated bathymetric highs reaching water depths of only 1000m compared to 2000m in the western part of Java.

The decreasing sediment supply and corresponding reduction in volume of the outer forearc high together with an increased seafloor roughness of the oceanic plate imply a general modification in subduction processes and mechanics. This is also supported by the progressive increase in frontal slope angle from west to east at the deformation front. The assumed frontal erosion instead of accretion is documented by a steepening of the lower slope angle compared to the neighbouring segments.

In September/October 2004 two wide-angle-seismic profiles were shot perpendicular to the trench and one profile parallel to the trench near the coast during RV SONNE cruise SO179. In the following only the first two profiles will be referred. Shots were recorded on coastal stations of a temporal dense seismometer network around Mer-

api volcano. This enables the offshore model to be continued to Central Java. The wide-angle-seismic profiles are complemented by additional magnetic and gravimetric observations as well as high resolution swath mapping.

The wide-angle-seismic traveltimes were modelled with a forward raytracing method to receive a detailed geodynamic view of the subduction zone.

The dip angle of the downgoing oceanic plate is about 10 degrees on both profiles. The thickness of the oceanic plate decreases from 9 km on the eastern profile to 8 km on the western profile, which is thicker than the global average. This could be associated with the subduction of the Roo Rise, an oceanic plateau which is underthrust between 110°E and 115°E.

The sediments in the forearc basin on the eastern profile locally reach a thickness of 5 km. The forearc basin strata onlap the outer forearc high and are tilted landward. Recent deformation is indicated by the landward-tilted basement north of the forearc basin. Forearc basin sediments beneath the western profile are 3 km thick and mainly undisturbed. In the nearcoast part, crossing the third profile, a local positive velocity anomaly was detected in the basement of the upper plate.

Together with gravimetric data a detailed model of the Central Java subduction zone with a landward connection from the onshore seismometer stations of the profiles will be presented.