



Preferential Lower Crustal Extension Precedes Continental Break-Up within the Vietnamese Sunda Shelf, SW South China Sea

L. Wilson, A. Carmona, P. D. Clift, and L. V. Hoang

ABSTRACT

The Sunda Shelf is an extensional basin located south of the Mekong Delta offshore southern Vietnam. It was generated by extension starting in the Eocene and terminating in the middle Miocene around 16 Ma when the basin was inverted following collision of the Dangerous Grounds block and Borneo. In this study we interpreted a series of seismic profiles crossing the basin in order to quantify the amount of subsidence and extension manifest as normal faults. Using the total accommodation space as a way of estimating total cost of extension and with the upper crust constrained by the normal faulting we were able to model the basin evolution and identify a general mismatch between low amounts of upper crust extension and high amounts of subsidence. The amount of preferential lower crustal extension increases towards the continent-ocean boundary (COB) on the east side of the basin. Loss of the lower crust through ductile flow is inferred to have occurred in advance of the seafloor spreading which terminated immediately east of the Sunda Shelf at 16 Ma, forming the Deep Regional Unconformity. The amount of lower crustal extension is extreme in places, reaching beta factors of ~ 10 even when the brittle upper crust is assumed to be only 10 km at the initiation of extension. Some of the lower crustal flow may have occurred later due to sediment loading from the Mekong Delta, which initiated here at ~ 8 Ma.

NOTES
