

## **Gravity anomalies, subsidence history, and the tectonic evolution of the Malay and Penyu basins, offshore Peninsular Malaysia**

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The tectonic subsidence and gravity anomalies in the Malay and Penyu basins, offshore Peninsular Malaysia, were analysed using gravity, well, and thermal history data. These extensional basins contain up to 14 km of sediment fill which implies that the crust beneath them had been thinned significantly during basin development. Gravity data were used to investigate the isostatic compensation mechanism of these basins. The basins are characterised by broad negative free-air gravity anomalies of between  $-20$  and  $-30$  mGal. Gravity modelling results show that they are underlain by a relatively thinned crust, indicating some form of crustal stretching, but the Moho depth calculated based on the free-air gravity data is about 25% deeper than that predicted by Airy

isostasy (Backstrip Moho). This suggests that the Airy model overestimates the compensation and that the basins are probably undercompensated isostatically. The discrepancy between the gravity-derived Moho and the Backstrip Moho suggests that there is an extra amount of tectonic subsidence that is not compensated by crustal thinning. This uncompensated or anomalous tectonic subsidence is interpreted to be due to thin-skinned crustal extension that did not involve the mantle lithosphere. These results appear to be consistent with the strike-slip tectonic history of the basins.

Manuscript received 12 October 1999; accepted 12 November 1999