



The role of detachment faulting in continental breakup and the unroofing of mantle within the continent-ocean transition.

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Detachment faulting is known from some quite different settings, including the extensional collapse of overthickened crust, mid-ocean ridges (particularly slow-spreading), and magma-poor rifted margins. Whereas post-orogenic collapse is the extension of hot, thick and very weak crust, probably characterised by a very weak lower crust and significant magmatism, that at magma-poor rifted margins is the extension of thin, cold, brittle crust and involves the uppermost mantle. The key to the development of detachment faults is the serpentinisation of the uppermost mantle, allowing detachment faults such as S (Galicia margin) to remain active at low-angles through a combination of unusually low friction coefficients and the possible build-up of fluid pressure in sealed cracks.

However S and the similar H detachment further south are both cut by later detachment faults responsible for the exhumation of mantle rocks within the COT. The broad expanse of mantle rocks oceanward is itself faulted requiring further phases of faulting. Landward-dipping deep reflections are interpreted as the abandoned root zones of successive detachments truncated by younger structures developing at the rift axis.