

New stratigraphic constraints on timing and geometry of the Arabia-Eurasia collision & closure of the Tethys seaway



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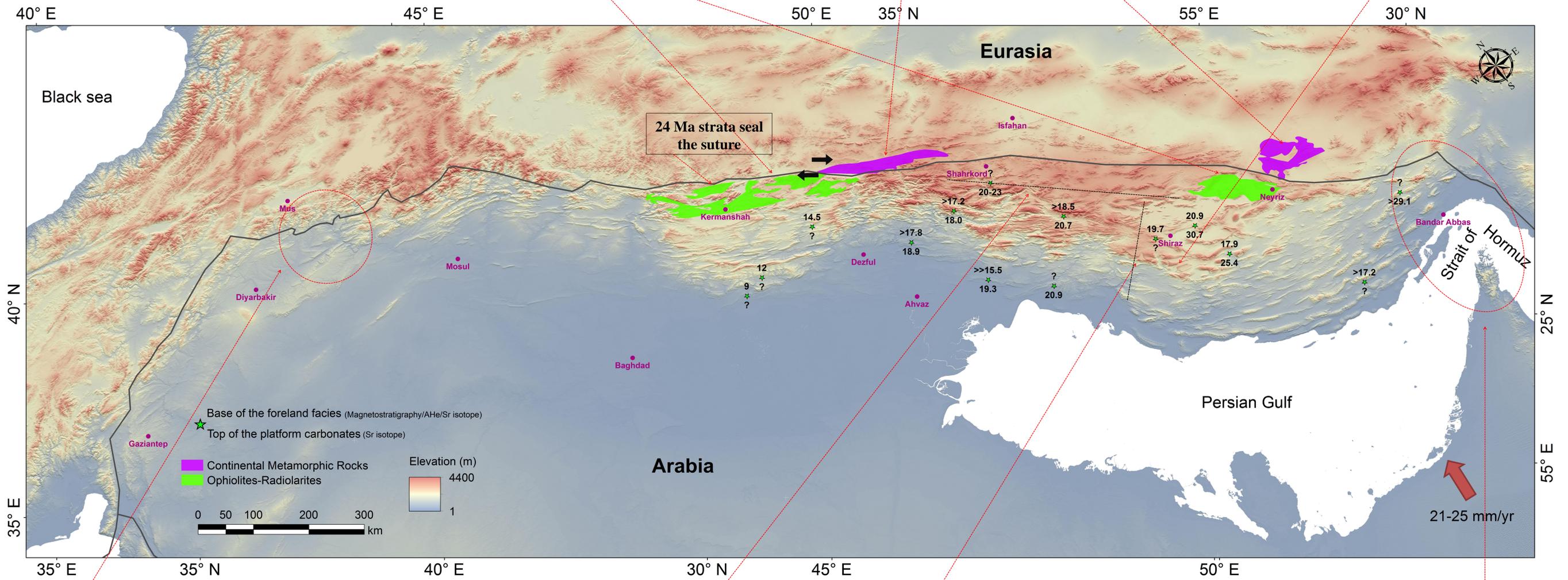
Timing and geometry of the Arabia-Eurasia collision has long been in dispute. The complexity partly lies in the multiplicity of the collision since some microcontinents and other topographic features existed in the intervening ocean. The complication also arises from different definitions of collision and methods used to date it. Closing of the Neotethys is said that was diachronous and the existing models indicate that it began earlier in the northwest and progressed to southeast. However, within the >1500-km-long Zagros fold thrust belt more precise information is now emerging for details of the diachroneity, and indicates that the Arabian platform initially docked with the Eurasia at two widely (~ 900 km) separated sites from which the base of foreland deposits youngs towards the middle. Today these sites are characterized on the Arabian side by Oman-like ophiolites and radiolarites obducted in Late Cretaceous time, and continental metamorphic rocks are exposed on the northern side of the suture. The southeastern collision site near the present day Strait of Hormuz closed off the Neotethys from the Indian Ocean and thick evaporite strata formed throughout the basin and away from the uplifting suture zone from ~ 17 Ma.

Continent-continent collision first started where the Oman-like ophiolites are now exposed south of the Zagros suture. Early collision has resulted in denudation of deeper parts of the crustal profiles on either side of these sites. Across from the ophiolites on the northern side of the suture, gneisses and micaschists are exposed in two isolated windows (the right lateral offset is due to post-collisional strike-slip motion along the Zagros Main Thrust).

Micaschists, gneisses, amphibolites

20 Ma red beds containing heavy minerals with Eurasian provenance unconformably overlie platform carbonates

24 Ma strata seal the suture



Collision at ~14 Ma terminates flow from the Tethyan region into the Indian Ocean

Westward progression of deformation is indicated by younging of the base of the foreland deposits

Southward progression of deformation is indicated by younging of the base of the foreland deposits

The strait of Hormuz closed off ~ 17 Ma; the remnant of the Tethys was choked to desiccation