



Mediterranean snapshots of accelerated retreat and geodynamic instability in continental orogenesis

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In stark contrast to the continental collision of India-Asia type systems and even accretionary orogenesis of Andean-type systems, the Aegean/Anatolian region and its immediate older Mediterranean siblings (e.g. the Calabrian-Apennine system, the Carpathian-Pannonian-Vrancea system) owe their exciting contemporary geodynamics (high seismicity, exhumational processes, rapid surface deformation) to accelerated subducting slab retreat in a collision of limited net plate convergence. Classic “mountain belt” phenomena such as erosion and evacuation of material by intense surface processes, and extreme relief have been largely absent (at least since the Miocene for the Aegean/Anatolian system). Our data from Project ACCEL (Aegean Core Complexes along an Extended Lithosphere, see other talks & posters in this session) and many other studies, highlight that the retreating Hellenic slab instability governs displacement velocities for the Aegean/Anatolian system. We have found new evidence in the Western Aegean for extensional crustal failure initiating very soon (a few m.y.) after the Cycladic blueschist genesis that persists until to the late Miocene and likely much later, thereby attesting to the extreme and prolonged crustal thinning associated with Hellenic Slab retreat. This accelerated subducting slab retreat would appear to be due to the dynamic instability inherent in a slab whose subducting width (plate boundary length) is short. The (palaeo) Mediterranean hosts other striking examples of accelerated slab retreat almost certainly led by dynamic instability. The Calabrian-Apennine system, for example, is marked by very deep slab seismicity, intense surface extension, and is associated with a recently discovered very high spreading rate in the Tyrrhenian Sea (the back arc to the Calabrian). Similarly, the Vrancea slab is the fi-

nal snapshot of accelerated retreat with deep subduction beneath an ancestral portion of the Mediterranean, the Pannonian Basin. We therefore suggest that the Mediterranean region offers a possibly unique series of snapshots of accelerated retreat that accompanies geodynamic instability of short island lengths in continental orogenesis