



## Cenozoic Evolution of the West Cycladic Detachment System

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Extension in the Aegean led to the formation of metamorphic core complexes and domes, with multistage extensional detachments cutting rocks of the Attic-Cycladic Crystalline at different structural and lithostratigraphic levels. Four kinematic provenances are here distinguished in the Cycladic extensional detachment system: (1) The North (Andros-Ikaria) and (2) Central (Naxos-Paros) Cycladic Detachment Systems, showing top N/NE sense of shear; (3) the South Cycladic Detachment System (Ios-Amorgos), part of the South Cycladic Shear Zone, with evidence for two opposite kinematic domains, an older top S/SE and a younger top N/NW sense of shear. In contrast, the newly documented (4) West Cycladic Detachment System (Sifnos-Lavrion) is dominated by a top SW/SSW sense of shear. Low-angled extensional detachments nucleated in the ductile regime and show progressive overprinting by ductile-brittle and then brittle deformation processes on Kea, Kythnos and Serifos. On Sifnos, an older top NE and brittle-ductile younger event, with top SW kinematics has been documented. In comparison, on the Greek mainland in Attica, top SW/SSW sense of shear allows the regional structure to be expanded. At both Lavrion in Attica and Serifos, the extensional detachments were intruded by syn-tectonic Late Miocene granodiorites. Cenozoic extension in the Western Cyclades is suggested to begin in the Eocene, with early S-type granite intrusion on Serifos at 43-37 Ma (U-Pb zircon). This is supported by Eocene/Early Oligocene Rb/Sr and Ar/Ar (cooling) ages of hanging-wall schists and marbles. Similar cooling ages, (post-) dating high-pressure/low-temperature metamorphism, have been described from Sifnos. During the Oligocene/Miocene, a decrease in greenschist-facies ages has been determined on the Serifos-Kythnos-Kea transect. Similar ages of greenschist-facies metamorphism have also been found on Sifnos. Initial stages of the Serifos granodiorite intrusion, coeval with initiation of the main Serifos metamorphic core complex, gave Mid-Miocene ages of ca. 15-11 Ma (U/Pb, Rb/Sr, and Ar/Ar); these ages are also found as Ar/Ar white mica ages on Kea and supported by similar He-ages from hanging-wall rocks above the low-angled detachment on Serifos. This event continued since the Late Miocene with another pulse of granodiorite and the formation of ductile extensional shear zones and brittle-ductile/brittle low-angle normal faults. In this contribution, we show the significance of extension with top SW/SSW sense of shear, adapting the tectonic model for the Cycladic region.