



Large-scale geometry and timing of the detachment systems in the Cyclades (Greece). Insight from Makronisos

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Characterizing the large-scale geometry of detachment zones and the timing of their movement is crucial to our overall understanding of the dynamics of metamorphic core complexes (MCCs). The Cyclades presents a world-class example of middle and lower crust that was exhumed below low angle detachments in such MCCs. They formed during Oligo-Miocene times in the stretched back-arc of the Hellenic subduction zone. Recently, regional correlations have emphasized the role of two large-scale detachment systems: the North Cycladic Detachment System (NCDS), running from Evia to Mykonos (at least) and the Western Cyclades Detachment System (WCDS) running from Serifos to Kea. Both detachment systems exhumed the Cycladic Blueschist unit and the basement unit below the Pelagonian. However, they are antithetic, with the NCDS having a top-NNE and the WCDS a top-SSW movement, and their timings are, in detail, different.

Lithological and structural observations, together with radiochronologic and metamorphic constraints from the island of Makronisos allow us to bridge the gap between the Western Cyclades and Attica and prolongate the WCDS towards the NW, giving it an overall length of 90 km. Depending on the tectonostratigraphic position of Makronisos, which remains unclear, we propose two alternative scenarios for the large-scale geometry and dynamics of the WCDS. We also integrate our data within a model at the scale of the whole Cycladic realm and propose a mechanical explanation for the activity, location and timing of the major detachment systems.