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Neogene brittle detachment faulting on Kos during formation of the Cycladic-Menderes metamorphic core complex (Greece/Turkey)

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The southern limit of the Cycladic-Menderes metamorphic core complex has recently been proposed to be formed by an Oligocene-early Miocene break-away detachment fault. Proving a break-away detachment fault is difficult due to absence of a metamorphic contrast between hangingwall and footwall. The island of Kos lies close to the inferred break-away fault. It exposes anchimetamorphic rocks, intruded and contact-metamorphosed at upper crustal levels by a 12 Ma old monzonite. Here, we show that exhumation of these rocks occurred along a top-to-the-north brittle extensional detachment. Kos should thus be placed within the Cyclades-Menderes extensional province. The age of exhumation is younger than the proposed activity of the break-away fault, the existence of which we cannot corroborate. We argue that Neogene exhumation of the central Cyclades-Menderes metamorphic core complex cannot be explained by a single extensional detachment.