

The hanging wall to the West Cycladic Detachment System; new data from Aghios Georgios, Western Aegean, Greece

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The central Aegean formed by extension due to Oligo-Miocene-aged rollback of the Hellenic subduction zone superposed on an exhumed Eocene HP-terrane, the Cycladic Blueschist Unit (CBU). Imbrication during exhumation formed two major nappes in the CBU; the Lower and the Upper Cycladic Blueschist Nappes. Subsequent extension was accommodated on several low-angled normal detachments, with a regional bimodal extensional shear-sense; detachments in the Northern Cyclades had top-N/NE displacements, cutting the Upper Cycladic Blueschist Nappe, whilst the West Cycladic Detachment System (WCDS), in the Western Cyclades, had a top-SSW shear-sense, cutting the Lower Cycladic Blueschist Nappe.

Above the Upper Cycladic Blueschist Nappe, well preserved outcrops of the overlying Pelagonian Zone are exposed on Syros (Vari Unit) and on Andros (Makrotantalón Unit). In contrast, the Pelagonian Zone is only sporadically exposed directly above the Lower Cycladic Blueschist Nappe, as hanging wall ultracataclastic and cataclastic dolostones of the WCDS.

However, Aghios Georgios, a very small island to the SSW of the Western Cyclades, must also lie in the hanging wall of the WCDS, which is preserved as footwall ultramylonites in the CBU exposed to the NNE on Makronisos. Recent work on Aghios Georgios revealed that the island comprises essentially two lithologies. The eastern part consists of granitoid gneisses that gave a U-Pb zircon age of 249 ± 3 Ma; these rocks are lithologically very similar to quartzofeldspathic orthogneisses in the Vari Unit in SE Syros, intruded at 240-244 Ma (early Triassic). The eastern part of Aghios Georgios comprises schists, including relict blueschist facies assemblages, that gave three white-mica Ar/Ar ages between 52-48 Ma, with a further sample giving dispersed dates between 57-77 Ma, all significantly older than the 15-23 Ma white-mica Ar/Ar ages from the CBU on Makronisos. These schists might be comparable to the Makrotantalón Unit on Andros, which includes an early Cretaceous high-P assemblage correlated with a high-P metamorphic event seen elsewhere in the Pelagonian Zone.