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The exhumation history of Miocene low-angle detachments in the Lavrion Peninsula, Attic-Cycladic Massif, Greece: Implications for the tectonostratigraphy of the Cycladic Blueschist Unit

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Within the Hellenides of Greece, Attica and Evvia lie at the extreme western limit of the Attic-Cycladic Massif (ACM) at the boundary between the relatively unextended Pelagonian realm and the highly attenuated Cyclades. In this area, three different portions of the greater nappe stack of Greece are exposed: the Sub-Pelagonian nappe, the Cycladic Blueschist Unit (CBU) and the so-called Basal Unit, the para-autochthonous nappe to the CBU. The distinction between Basal Unit and CBU is often not clear due to similar histories of blueschist facies metamorphism and greenschist retrogression for both units. The Basal Unit is defined by exposures of the Alymyropotamos Unit on the island of Evvia. Based on the large amount of carbonate exposed in the Attican peninsula relative to CBU exposed in the Cyclades, much of Attica has previously been assigned to the Basal Unit. In Lavrion, the dominant structure is a sub-horizontal detachment which juxtaposes lower plate rocks of the Kamariza Unit against the Lavrion Unit of the upper plate, the South Attican Detachment (SAD). Recent mapping has called into question the old association of many of these units with the Basal Unit. Based on newly acquired (U-Th)/He data, the SAD is correlative with other detachments exposed along the greater Western Cycladic Detachment Systems (WCDS) in the western Cyclades. Furthermore, this data points to the WCDS being composed of two distinct detachments, one active in the middle Miocene (16-12 Ma) and another in the Late Miocene (6-9 Ma). This study seeks to better define the tectonostratigraphy exposed by these different detachments, as well as better define what is and is not Basal Unit. Detrital zircon U-Pb data from clastic metasediments the CBU of the western Cyclades, Attica, and Evvia is compared with Basal Unit sediments in order to discriminate different tectonostratigraphic levels of the CBU exposed by these two detachments, as well as CBU from Basal Unit. Lastly, Neogene sediments exposed in the Lavrion Peninsula are determined to be sourced from the Sub-Pelagonian nappe based on (U-Th)/He and detrital zircon U-Pb data. Furthermore, palynologic data suggest that these sediments record denudation of the Sub-Pelagonian nappe as early as the Oligocene.

Keywords: Cycladic Blueschist Unit, Cyclades, Greece, (U-Th)/He, Detrital zircon U-Pb