



Exhumation rates in the Metamorphic Core Complexes of the Cyclades (Aegean domain)

Benjamin Huet (1), Loïc Labrousse (1), Patrick Monié (2), Laetitia Le Pourhiet (1), Laurent Jolivet (3), and Evgunii Burov (1)

(1) IStEP, UMR 7193, Université Pierre et Marie Curie - CNRS, 4 place Jussieu, 75252 Paris cedex 5, France , (2) Géosciences Montpellier, UMR 5243, Université Montpellier - CNRS, 2 place Bataillon, 34095 Montpellier cedex 5, France, (3) STO, UMR 6113, Université d'Orléans - CNRS, 1A rue de la Férollerie, 45071 Orléans cedex 2, France

In the Cyclades, two HP-LT units : the Attic-Cycladic Blueschist unit (ACBS) and the Cycladic basement (CB) have been exhumed in Metamorphic Core Complexes (MCCs). Their complete exhumation is the finite result of successive processes acting during (syn-orogenic) and after (post-orogenic) subduction is active. This contribution is an attempt to determine the evolution of the exhumation rates in the two metamorphic units for five representative islands (Andros, Tinos, Syros, Naxos and Ios), from integrated field observations, metamorphic petrology and ^{40}Ar - ^{39}Ar dating. New P-T paths (Andros and Ios) and $^{40}\text{Ar}/^{39}\text{Ar}$ data (Andros, Tinos, Syros, Ios), together with published P-T paths (Tinos, Syros, Naxos) and high and low temperature radiochronology (Andros, Tinos, Syros, Naxos and Ios) provide precise P-T-t paths as well as exhumation rate estimates showing regional diachronism especially regard to post-orogenic evolution.

The timing of transition between the syn- and the post-orogenic phases and the timing of formation of metamorphic core complexes can be regionally compared. Spatial variations of strain rates and ages during the post-orogenic phase are related to the inherited crustal geometry at the onset of extension. We finally present thermomechanical models of MCC formation. The best fit between synthetic datas and their natural counterparts for the post-orogenic evolution in the Cyclades is obtained with an initial crustal wedge geometry, highlighting the prevalent role of structural inheritance on crustal-scale tectonics.