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Exhumation of high-pressure rocks driven by slab rollback in the Aegean

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Rocks metamorphosed under high-pressure and ultra high-pressure conditions in subduction zones come back to the surface relatively soon after their burial and at rates comparable to plate boundary velocities. In the Mediterranean realm, their occurrence in several belts related to a single subduction event shows that the burial-exhumation cycle is a recurrent transient process. Using the Aegean belt as an example, we show that the exhumation of HP rocks is associated in time and space with the subduction of small continental lithosphere blocks that triggers slab rollback, creating the necessary space for the exhumation of the buoyant continental crust that was deeply buried just before. Some general properties are characteristic of our model: i) the full sequence of events (crust-mantle delamination, slab rollback and trench retreat, HP rock exhumation, asthenosphere heating and core-complex formation) arises entirely from the initial condition imposed by the subduction of a small continental block, ii) the burial-exhumation cycle is transient and can recur every time a small continental block is subducted and iii) no specific condition is required regarding the rheology and erosion rate of HP rocks.