

## **Rate of detachment of continental slices from the downgoing slab in a subduction zone**

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In the Gran Paradiso Massif (Western Alps), the Money Unit crops out as a tectonic window below the Gran Paradiso Unit. In both units, four stages of deformation and metamorphism have been identified [1]. Stage 1 reflects the phase of continental crust subduction (~18-20 kbar, 480-520 °C and ~13-18 kbar, 500-530 °C for the Gran Paradiso and the Money units, respectively). This yields a maximum difference of ~20 km in the depth reached by these two units during the early Alpine history. Thrusting of the Gran Paradiso Unit over the Money Unit (stage 2) led to the development of the main foliation (~12.5 kbar-14.5 kbar and 530-560 °C), identical in both units. The thrust contact was folded during stage 3 together with the entire Money Unit, and then both units were exhumed together (stage 4). Accessory phases (i.e. monazite, allanite, and xenotime) have been studied in key samples from the Money and Gran Paradiso Units. Their relative timing of growth and dissolution have been assessed by combining thermodynamic modelling, inclusion, textural and chemical (major and trace-element) data from both major and accessory phases. (U-Th-Pb) ages of allanite, monazite, and xenotime will be presented and tied with the evolution of the studied samples. The new data constrain (i) the age of the high pressure in the Money and the Gran Paradiso Units, (ii) the timing of the thrusting of the Gran Paradiso Unit over the lower pressure Money Unit and (iii) the exhumation rates in the Gran Paradiso Massif. Preliminary data indicate at most 3 to 5 Ma between the peak pressure (stage 1) and the thrusting event (stage 2), i.e. a displacement of the order of 2 to 4 mm/year.

[1] Manzotti *et al.* (2015) *J. Metamorph. Geol.* **33**, 981-1002.