Exhumation of crustal slivers in a subduction mélange in the eastern Betic Cordillera, SE Spain

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With the recent recognition of Miocene subduction ages in the lower nappes of the Betic Cordillera [1], its geochronological and tectonometamorphic evolution has become a point of discussion again. No current model can fully explain the metamorphic events found within the rocks of this mountain belt, especially in the upper part of the downgoing plate. The metamorphic evolution and contrast between nappes are reassessed here for an area in the eastern Sierra de los Filabres.

We found that two units can be distinguished between the subducted and later exhumed Iberian plate, and the interface with the overriding plate. The lower unit is a mafic slice intercalated with metasediments, which represents part of a rifted margin metamorphosed under medium pressure amphibolite facies conditions. The upper unit consists of a mélange, with mostly serpentinite bodies in the lower part and metasedimentary and granitic blocks in the upper part. High-pressure peak metamorphic conditions, up to 1.6-1.8 GPa and ~600 °C, have been derived from this unit, but various lithologies show contrasting prograde paths.

The mixing of crustal blocks and serpentinite bodies in the upper unit suggests that it is an accretionary complex, formed by underplating as crustal blocks detached and became exhumed along the subduction channel. This explains the metamorphic contrasts and exemplifies the exhumation of large crustal blocks in a subduction setting. It also supports the slab rollback hypothesis for the Betic Cordillera.

[1] Platt, J. et al., 2006. *Geology*, **34**, 981-984.

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