

## **U-Pb ages and cooling rates of variscan migmatites from the Central Iberian Zone: geodynamic implications**

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High-grade metamorphic rocks and crustal melts are key products and vectors in mountain building processes. The exhumation of such units in ancient orogens, usually constrained by crustal-scale shear zones, is not yet fully understood. By linking cooling rates of an high-grade metamorphic complex using different petrochronometers, we contribute to this debate by placing time constraints into the exhumation of these deep crustal units.

The Figueira de Castelo Rodrigo – Lumbrales Anatectic Complex (FCR-LAC) is located in the Central Iberian Zone (CIZ) of the European Variscan Belt. The FCR-LAC, composed of metatexites, diatexites and S-type granites, is bordered by 2 major transpressive sinistral shear zones. We present new LA-ICP-MS U-Pb ages for zircon and apatite of the migmatites in order to constrain the age of anatexis and cooling rates during the Variscan Orogeny.

U-Pb zircon ages of metatexites and diatexites range between 315-319 Ma, coeval with the anatectic-related granites. A mean U-Pb age of  $316.0 \pm 2.6$  Ma can be defined for the regional thermal peak. This is consistent with recent U-Pb ages of other CIZ migmatites, further emphasising this age as being representative of the variscan anatexis event. Occasional zircon growth in the 340-328 Ma period for the studied diatexites is interpreted as the result of prograde metamorphism predating the metamorphic peak.

Combining the age of the anatectic complex with distinct U-Pb apatite ages in metatexites and diatexites (314.3 to 301.5 Ma) we obtained cooling rates spanning from 34.7 to 75.6 °C/Ma. These high cooling rates suggest initial fast exhumation for the entire anatectic complex, compatible with geodynamic models that include near sub-vertical thrusting or transpression. This stage would predate the largely sub-horizontal late stage shearing that characterizes the shear zones delimiting the FCR-LAC. Similar settings have been also found in the variscan Massif Central, reinforcing the importance of shear zones in exhuming orogens at fast rates.

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