The Lower Allochthon of the Morais Allochthonous Complex, Trás-os-Montes, Portugal: New structural, age, and geochemistry data suggest changes in the interpretation of this tectonostratigraphic unit.

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Résumé

The allochthonous complexes of the Galicia-Trás-os-Montes Zone of NW Iberia consist of an ensemble of peri-Gondwanan terranes and ophiolitic units, stacked during the Variscan orogeny. The different units are grouped and classified according to their provenance and tectonic characteristics. The Lower Allochthon, lying beneath the oceanic units of the Middle Allochthon, evolved from the outermost parts of the northern Gondwana margin, and consists of a thick sequence of metasediments, alternating with a bimodal suite of igneous rocks, indicating that the margin experienced rifting during the Cambro-Ordovician transition.
This work analyzes a newly discovered tectonic contact in the Morais Complex, Portugal, which could be a first order tectonic boundary potentially related to the exhumation and emplacement of the Lower Allochthon in NW Iberia. The contact is described as a ductile fault, the Contins shear zone, and occurs at the boundary between the Lower Allochthon, with high-P relicts, and the underlying Parautochthon characterized by greenschist facies metamorphism. This contribution describes results of neutron diffraction experiments conducted at the Institute Laue-Langevin (ILL; France). Diffraction data were refined using MAUD software to obtain quantitative texture information for the main phases. Pole figures of relevant planes were interpreted in terms of slip-system activity to understand deformation conditions. Results point to a top-to-the SE general shearing in the mylonitic flow.

Furthermore, new geochronological and geochemical data from the Lower Allochthon provide renewed understanding of the history of the continental rifting of the northern margin of Gondwana and the opening of peri-Gondwanan ocean(s). Zircons have been collected for LA-MC-ICP-MS U–Pb analyses in four felsic metavolcanics, yielding concordant ages ranging from 485 ± 4 Ma to 491 ± 4 Ma. These ages, together with new and previous whole-rock geochemical data obtained from basic and felsic metavolcanic samples are interpreted to reflect rift-related magmatic pulses in a passive margin during Cambro-Ordovician transition.

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References

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