



Post-Variscan exhumation history and long-term landscape evolution of the western Rhenish Massif and surrounding areas

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The Northern Linksrheinisches Schiefergebirge is the western part of the Variscan fold-and-thrust belt in Central Europe. Published apatite fission-track ages cover the range of 159 (10) Ma to 203 (21) Ma in the Northern Linksrheinisches Schiefergebirge. The post-Variscan thermal and exhumation history of the foreland and fold-and-thrust belt in the Northern Linksrheinisches Schiefergebirge is part of the general post-Variscan geological evolution of the Rhenish Massif. To unravel the post-Variscan exhumation history and long-term landscape evolution samples of the RWTH-1 drill cuttings from various depths were analyzed. The well RWTH-1 is located at the Aachen Thrust in Aachen, Germany.

The four thermochronometric analyses (fission-track, (U-Th)/He on apatite and zircon each) and furthermore 2-D Modelling with HeFTy were performed at the Devonian to Carboniferous rocks of the RWTH-1.

The apatite (U-Th-Sm)/He ages of 5-10 Ma clarify, that the geothermal gradient is very young. The apatite fission-track ages ranging between 43-174 Ma confirm the published AFT data of the surrounding area and points to a post-Triassic exhumation. The zircon (U-Th)/He ages ranging from 198-239 Ma suggest an earlier post-Variscan exhumation, starting during the Lower-Middle Triassic. Comparing these results to existing geological records enable us to identify and quantify the relevant tectonic processes that shape the landscape of the western Rhenish Massif.