



Pre- to post-rift low-temperature and denudation history of the Upper Rhine rift system, Germany

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Uplift and denudation of the rift shoulders form a most striking morphological contrast to the subsidence within the Upper Rhine Rift sedimentary basin. This prominent feature might be initiated in Upper Cretaceous time, the pre-rift stage of the Upper Rhine rift system. Previous studies have shown that in more recent times the strongest uplift/denudation takes place in the Heidelberg region [1, 2]. In order to understand the tectonically driven denudation and morphodynamic processes of the Odenwald, fission-track and (U-Th)/He analysis were carried out on apatites collected from the crystalline basement as well as from the overlaying Lower Triassic siliciclastic sequence. In particular, near Heidelberg a vertical profile of nearly 500 m across the pre-Permian landsurface was sampled. The low-temperature thermochronology based on the apatite fission-track data allows detailed reconstruction of uplift and denudation as well as morphology as a function of time over the last 100 Ma. Of particular importance in this regard is an extraordinary high geothermal gradient of e.g. 70°C/km in the late Upper Cretaceous as a precursor to the Upper Rhine rifting [3].

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