



The relevance of tectonic structures for karst development in the Upper Jurassic carbonates of the German Molasse Basin

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The Upper Jurassic carbonate platform in the South German Molasse Basin, nowadays at 3 km depth, shows enhanced karst morphology. We pose the question: were there any prerequisites for the formation of the ancient subsurface flow network, which can be now partly deduced by the distribution of dolines and the shape of the paleomorphology? From investigation of a 100 sq km large 3-D seismic survey, we combine new ideas of the tectonic development of this area based on the strong correlation of facies distribution, tectonic and karst development. For instance, we observe that sinkholes line up subparallel to fault strike. We envisage the following development: The carbonate platform was exposed after early Cretaceous to lower Tertiary. A tectonic event in the Late Cretaceous caused strike-slip faulting, and the generation of a ridge escarpment. Hydraulic anisotropy was caused by fractures parallel to the strike direction of the major faults. However, it was not before the Alpine Orogeny caused the tilting of the platform to the south that karst development began in earnest, as water was forced through the ridge and hydraulic flow was governed by the faults and fractures. Different modes of development of karst in the Molasse Basin is important for the use of the Upper Jurassic carbonate platform as a geothermal reservoir.