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Paleoseismological investigations and Geomorphology on the Gaenserndorf Terrace in the central Vienna Basin (Austria)

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In the central Vienna Basin normal faults define the eastern and western margins of Pleistocene Danube terraces north of Vienna. The terrace body is built up of coarse sandy gravel and sand. Locally the terrace surface is covered with eolian and alluvial sediments of the last glacial revealing OSL/IRSL ages of about 15-16 ka. High resolution digital terrain models (LIDAR) show relicts of a periglacial landscape in the northern part of the Middle Pleistocene (MIS 8) terrace. Large elongated depressions in the northern parts of the terrace are interpreted as the basins of former thermokarst lakes due to analogies in recent periglacial zones. Draining valleys corrugate the fault scarps indicating advanced subsidence of the Aderklaa and Obersiebenbrunn Quaternary basins before the last Glacial. Obviously the periglacial morphology is only preserved in the elevated parts of the terrace which is located in the footwall of the bounding normal faults. In the hanging wall Quaternary basins are filled with up to 40 m thick Pleistocene and Holocene growth strata.

During the last decade three faults were investigated by trenching. In contrast to the earlier trench sites on the Markgrafneusiedl Fault and the Vienna Basin Transform Fault it was not possible to provide clear evidence for offset on the Aderklaa-Bockfliess fault because cryoturbation deformed the covering fluvial sediments together with the underlying Gaenserndorf terrace gravels. However it was possible to localize this fault precisely applying an electrical resistivity tomography. The resulting ERT-section shows an offset of the 200-300 ky old terrace and the underlying Miocene sediments of about 9-10 meters suggesting a vertical slip rate of 0.03 - 0.05 mm/a.