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# 3D geometry of the active Lassee flower structure (Vienna Basin fault system): data from integrated geophysical, geomorphological and geological mapping

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The Vienna Basin fault system is a slow (1-2 mm/y) active sinistral wrench fault extending from the Alps through the Vienna Basin into the West Carpathians. It comprises a complex array of NE-striking sinistral strike-slip segments, which differ both in their kinematic and seismologic properties. Among these, the Lassee segment 30 km east of Vienna is of particular interest for seismic hazard assessment. Although it is regarded as the seismic source of an I ˜ 9 earthquake in the 3rd century A.D. (Decker et al., 2006, J. Seismology), it shows a marked seismic slip deficit in younger historical times. Integrated mapping of the Lassee segment using 2D reflection seismics (by courtesy of OMV Austria), GPR, gravity data, geomorphological mapping and Quaternary basin analyses shows a negative flower structure, which is confined by an array of concave-up oblique-sinistral faults. The faults seem to root in the basal detachment of the Alpine-Carpathian floor thrust at some 8 km depth. The hangingwall of the flower structure includes a Quaternary basin filled with up to 120 m thick Pleistocene growth strata. Faults delimiting the flower structure to the east offset a Middle Pleistocene terrace of the Danube River. These faults coincide with an up to 20 m high morphological scarp, which is regarded as a composite fault scarp. Mapping of surface-breaking faults at this scarp uses high-resolution GPR sections with different centre frequencies (40 MHz, 500 MHz)in order to obtain both maximum exploration depth and high resolution images up to the surface.