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Fault backstripping: How to quantify normal faulting in the southern Vienna Basin

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The Vienna Basin is a structurally complex thin-skinned pull-apart basin (e.g. Royden, 1985) at the junction of the Eastern Alps and the Western Carpathians. It covers an area of about 3200 km^2 and sediment fill comprises up to 5.8 km thick Miocene clastic deposits. To quantify the kinematics and exact date of Miocene fault movements in order to better understand the mechanics, timing and sedimentary evolution of the Vienna Basin and of pull-apart basins in general, the southern part is investigated. To allocate the complex structural build-up, faults and stratigraphic horizons are mapped within a 3D seismic block (with courtesy of OMV-Austria). Dip-slip movement of faults are quantified with the fault backstripping technique (ten Veen & Kleinspehn, 2000; Wagreich & Schmid, 2002). This method is based on comparing basement subsidence curves of the hangingwall and footwall blocks. For subsidence calculations, data from 21 wells have been compiled, including thickness of stratigraphic layers, lithological properties from geophysical data and palaeontological reports. The basement subsidence curves show a corresponding trend with changes from high lo low subsidence rates (˜2000 - 400 m/Ma) from the Upper Karpatian to the Upper Pannonian (16.4 - 7.1 Ma). Transects within the seismic cube have been fixed, where fault movement is reconstructed in detail and results are cross-checked.

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