

## **Geodynamic evolution of the eastern Unken Syncline, Salzburg, Austria**

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Geologic field mapping and structural analysis of the sedimentary succession of the eastern Unken syncline revealed a diverse geodynamic evolution ever since its deposition (Rittner, 2006). Besides complex Paleogene and Neogene brittle deformations after nappe stacking of the Northern Calcareous Alps (not covered here), three main points concerning pre-Paleogene structural development could be identified:

In Rhaetian times, the broad facies belts of Dachstein limestone in the South and Hauptdolomite in the North of the study area were replaced by a more diverse pattern of reefal limestone (Steinplatte fm.) interfingering with small basins (Kössen fm.). One reef belt developed along the southern rim of today's Unken syncline (Steinplatte, Sonnwänd), in the Northeast another one is preserved (Kühstein). Thus, the geometry of the present-day Unken syncline was first delineated by reefs encircling a small basin.

In the Upper Jurassic (upper Oxfordian, lower Kimmeridgian) extension and tilting led to formation of horst-and-graben geometries. The bulk of the Unken syncline is seen as a E-W trending half-graben, with its northern rim representing the associated horst (Channell et al., 1992). In the East to Southeast, another structural high was developed, as is proven by the transport direction and spatial distribution of the Grubhörndl breccia (Lukesch, 2003). Block tilting of underlying Steinplatte limestone caused synsedimentary unconformities within the Tauglboden fm. at its top (Lukesch, 2003, Rittner, 2006). Tilting direction of these blocks and spatial distribution of the Tauglboden fm. support a paleo-dip towards the West in the study area, causing widening and deepening of the depositional area in this direction.

The paleo-relief was filled in Latest Jurassic times by the silicious marls and limestones of the Oberalm and Ammergau fm. In the Cretaceous, increasing siliciclastic input and coarsening upward in the Lackbach beds (equivalent of Roßfeld fm.) signalises onset of orogenic activity some way south of the study area. Deposition in the Unken syncline ends in lower Aptian times, giving a constraint for the emplacement of the overlying Berchtesgaden nappe. The nappe contact truncates the pre-existing syncline, thus giving an upper timing constraint of its formation.

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