to the size of the slump body. Given the nature of a typical outcrop, which is usually 2D and some ten meters long, this requirement will not be met, and the sample will be incomplete, giving unreliable information. In the outcrop described here, typically 1-4 slump fold axis measurements per slumped bed could be made, which is not sufficient to interpret slump dynamics. Only the assumption of unchanged slope throughout deposition of the Ammergau Formation and the treatment of all collected data together allows an interpretation.

The Upper Jurassic to Lower Cretaceous Ammergau Formation of the Ampelsbach gorge in the Achensee region has many slumps. They are typically restricted to single or multiple beds between undisturbed beds. Some slumps are erosionally truncated or sealed at the top, whereas the base shows gradual increase in deformation. Slump folds have typically axial surfaces parallel or slightly inclined to bedding and fold style of most folds is similar, only few parallel folds were observed. Facing of folds is not systematic. Type 3 fold interferences are more common than type 2 fold interferences. In the latter case, the refolded fold is of similar type, whereas the overprinting fold is of parallel type. Lineations on folded bedding planes are parallel to hinges of similar folds. Tensional structures, i.e. listric normal faults and boudins are abundant, but are not observed together with folds. Axes of similar style slump folds cluster about an E-W direction, hinges of parallel folds trend N-S. Neither slump folds nor normal faults do indicate a preferred direction of slump movement. However, total thickness of the Ammergau Formation increases to the west from 80m in the studied section to 600 m 10 km to the SW (Nagel et al. 1976), giving an independent estimate of paleoslope orientation. Therefore we interpret a westdirected slump movement.

Various aspects of slump sheet kinematics can be described by (1) a dislocation model (Farrell 1984) and (2) a shear zone model (Ortner 2007). The first model describes orientation of fold axes on the scale of the slump as a function of the maximum offset across the basal glide plane relative to its size. It neglects the effects of large simple shear strain during transport, which leads to a downslope reorientation of foldaxes, change of fold style from parallel to similar and rotation of axial planes of folds toward parallelity with bedding, and formation of stretching lineations. Therefore we suggest (also) to use a shear zone model when interpreting slump deposits.

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Ortner, H. (2007): Styles of soft-sediment deformation on top of a growing fold system in the Gosau Group at Muttekopf, Northern Calcareous Alps, Austria: Slumping versus tectonic deformation. - Sed. Geol., **196**: 99-118, Amsterdam.

Stratal patterns of clastic wedges in transpressive systems: Gosau Group of Muttekopf revisited

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Cretaceous nappe stacking in the Northern Calcareous Alps took place in a transpressive setting. Initial thrust sheet detachment and subsequent (N)NW-directed transport was accompanied by dextral shear along NW-striking high-angle faults. Deposition of deep water sediments started before and outlasted Late Cretaceous thrust activity.

Deposition on thrust-sheet-tops was controlled by internal thrust-sheet deformation during transport. Upper Cretaceous thrust-sheet-top sediments of the Northern Calcareous Alps are locally characterized by very coarse clastic facies and syndepositional growth of WSW-trending folds resulting in the development of progressive unconformities.

In well-studied continental growth strata of the southern Pyrenees (e.g. at the classic locality of Sant Lorenc de Morunys), folds are more or less cylindrical and the characteristics of unconformities do not change significantly in different cross sections. The Gosau Group at Muttekopf is preserved in the core of the Muttekopf syncline and on top of the southerly adjacent anticline. Three sections across successive parts of the Muttekopf syncline are fundamentally different and show, from W to E, (1) combined rotational offlap-onlap, (2) combined rotational offlap-onlap-overlap and (3) rotational overlap in the growth strata. Section (2) crosses a high-angle fault with 1 km offset associated with a change from a fold domain in the west, where the Gosau Group is restricted to the core of a kilometric syncline, and a fault domain in the east, where the Gosau Group overlaps a hectometric system of thrust-related anticlines and synclines along the southern basin margin.

A detailed study of the main unconformity in cross section (2) which displays combined rotational offlap-onlap-overlap revealed that the offlap-onlap pattern is mainly produced by changes in strike instead of changes in dip as seen in the classic examples. The geological map of the area shows that the cross sections displaying rotational offlap-onlap (1) and rotational overlap (3) are located between high-angle faults, whereas the main unconformity in cross section (2) is located above a high-angle faults crossing the basin.

We imagine a basin in which dextral shearing and folding in the bedrock of the growth strata were contemporaneously active. This would cause both tilting of fold limbs and offset across the high-angle faults. Given some surface topography of the depositional system, lateral offset would create topography which would be onlapped by younger sediments. At the transition from the slope related to fold growth to the slope related to high-angle faults strike changes across angular unconformities. Therefore the apparent offlap-onlap-overlap pattern produced by changes of strike rather documents the activity of high-angle faults than folding.

Geometry and sequence of thrusting in the Subalpine Molasse of western Austria and Bavaria

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Paleomagnetic data from all main external tectonic units of the Western part of the Eastern Alps indicate large differential vertical axis rotations between the foreland and the Subalpine Molasse, and between the Helvetic nappes and the Subalpine Molasse.