in Upper Cretaceous-Eocene rocks of the Salzburg-Reichenhall Gosau basin along the ISAM fault. However, the sequence of activation is in part still uncertain. Paleostress tensor group A (N-S thrust compression) is characterized by mainly S-dipping thrust faults. Paleostress tensor group B (N-S strike-slip compression) comprises mainly NNE-trending sinistral and NNW-trending dextral strike-slip faults. Together, these result in ca. N-S strike-slip compression. Paleostress tensor group C (NW-SE strike-slip compression) is also only found in a few examples. Paleostress tensor group D (NE-SW strike-slip compression) is found in a several examples and would fit into kinematics needed to activate the ISAM strike-slip fault system. Paleostress tensor group E (E-W extension): includes mainly WSW-dipping normal faults with a dominantly E-dipping lineation and subordinate ca. E-dipping normal faults, which could be explained by ca. E-W extension.

Gravity tectonics and emplacement mechanisms of evaporite mélanges: conceptual models and application to the central Northern Calcareous Alps

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Evaporite mélanges often form detachment respectively decollément surfaces of major extensional and contractional allochthons because of their very low shear resistance. Due to the deposition of evaporites during an early stage of passive continental margin formation, they are commonly overlain by thick successions of carbonates and/or siliciclastic rocks from the main thermal subsidence stage of passive margin formation, and these rocks are commonly resistant against penetrative internal deformation. The most common cases of evaporite mélanges are such (1) at passive continental margins, where they are deformed during gravity-driven extension, commonly raft tectonics, in an extensional geodynamic setting, and (2) in external foreland fold-thrust belts within a convergent geodynamic setting. In the following, we review first the most important features of both settings and then we apply these to the central Northern Calcareous Alps.

In gravity-driven raft tectonics at passive continental margins, an upper extensional domain is distinguished from a lower compressional domain at the toe (e.g,. Butler & Paton 2010). Activation of translation is at low temperature (commonly within ca. the oil window), mainly driven by thickness differences of the overburden. Motion is ocean-wards in intermediate stages of the depositional history of the passive continental margin and may last over a long period as long a topographic surface gradient is in existence. The resulting structure of the extensional allochthon is characterized by pronounced thickness variations of the syn-tectonic overburden within the extensional domain, particularly of the infill of halfgraben structures. In contrast, external foreland fold-thrust belts are generally transported continent-wards in episodic shortening at the termination of the sediment deposition, and no pronounced thickness variations occur in the overburden except in syn-sedimentary wedge-top basins. In nature, extensional deformation may have been overprinted by subsequent contraction causing complications in the structure of the thin-skinned fold-thrust belt.

The central and eastern Northern Calcareous Alps are called to have formed by gravity-driven sliding of thick masses of mainly Middle-Upper Triassic carbonate platform on the Permian-Lower Trassic evaporite mélange during Mid-Late Jurassic times. Main arguments for this interpretation are the presence of Haselgebirge clasts in mainly Upper Jurassic and also Lower Cretaceous formations and the presence of major up to mountain-sized blocks in a Haselgebirge matrix, particularly of limestones of the Hallstatt facies realm. This interpretation also assumes a continent-ward motion, considered as sliding in local basins, e.g., the Lammer basin. We challenge the interpretation of gravity-driven emplacement of the present structural edifice and present the following basic arguments for an essentially an Early to early Late Cretaceous age of emplacement of cover nappe with the Permian-Lower Trassic evaporitic Haselgebirge mélange at the base. These units were transported continent-wards against gravity on ductile evaporite mylonite zones partly over the Lower Cretaceous Rossfeld Formation, which includes many clasts derived from the Haselgebirge Fm. and its exotic blocks deposited in front of the incoming nappe. Ductile mylonite zones are well preserved mainly in sulphates (anhydrite, polyhalite), partly dated at ca. 110 Ma. Such mylonitic high-temperature shear zones were mapped in several areas from the southern margin (e.g., Rettenstein and Werfen Imbricate zone) to close to the northern margin of the Northern Calcareous Alps (Berchtesgaden - Dürrnberg). According to fluid inclusions, the Haselgebirge sulphates experienced a relatively high-temperature (>240 °C). Except differences between facies domains like Hallstatt and Dachstein facies realms, no significant thickness variations and wedge-shaped are known either in the Middle-Upper Triassic nor Jurassic stratigraphic units virtually excluding exclusively Jurassic raft tectonics as mechanism for evaporitic mélange emplacement. Of course, the new interpretation does not exclude earlier stages of local gravity sliding, e.g., during Late Jurassic, likely on front of convergent allochthons. However, the main body (Juvavic tectonic units) emplaced along a „high"-temperature ductile shear zone Haselgebirge evaporite mélange) as preserved in sulphate mylonites in a Cretaceous fold-thrust belt. Furthermore, the evaporite mélange includes abundant tectonic clasts of rift-related plutonic and volcanic rocks, which were partly dated as Early Permian. These, together with a high variety of Permian to Jurassic sedimentary rocks, were incorporated during nappe emplacement.

Butler, R.W.H. & Paton, D.A. (2010): Evaluating lateral compaction in deepwater fold and thrust belts: How much are we missing from „nature's sandbox"? - GSA Today, **20**/3: 4-