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Atmosphärische Effekte in der Geodäsie

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Geodätische Weltraumverfahren wie VLBI (Very Long Baseline Interferometry), SLR (Satellite Laser Ranging) oder GPS (Global Positioning System) und Schwerefeldmissionen wie GRACE (Gravity Recovery and Climate Experiment) und GOCE (Gravity Field and Steady State Ocean Circulation Explorer) werden in vielfältiger Weise von atmosphärischen Effekten beeinflusst: Die Ausbreitungsgeschwindigkeit der Signale von Satelliten oder extragalaktischer Radioquellen wird in der Ionosphäre und der neutralen Atmosphäre signifikant verändert, was einen limitierenden Faktor für die Genauigkeiten von SLR, GPS und VLBI darstellt. Andererseits bewirken Luftdruckänderungen an der Erdoberfläche Deformationen der festen Erde im Zentimeterbereich, die bei der Auswertung der geodätischen Weltraumverfahren berücksichtigt werden müssen. Zusammen mit den globalen Windgeschwindigkeiten verändern die Luftdruckvariationen die Erdrotation, und sie beeinflussen die Messung des Erdschwerefeldes mit GRACE und GOCE.
Im Rahmen des Global Geodetic Observing System (GGOS) der IAG (International Association of Geodesy) sollen nun alle Komponenten - Geometrie/Kinematik, Erdrotation und Schwerefeld der Erde - übergreifend behandelt werden. Eine wesentliche Rolle spielt dabei die konsistente Modellierung aller atmosphärischen Effekte. In der Präsentation wird auf diese Einflüsse in der Geodäsie eingegangen, und es wird gezeigt, wie mit Daten des numerischen Wettermodells des ECMWF (European Centre for Medium-Range Weather Forecasts) die benötigten Größen berechnet werden können.

Lithofacies and depositional environment in the upper Hall Formation, Alpine Molasse basin, Upper Austria

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Oil and gas is being explored in the Upper Austrian Molasse since the 1950ies. The mature basin comprises several prospective stratigraphic intervals. The upper part of the Miocene Hall Formation is one of the areas of investigation that gains more and more in importance, as it has not been targeted systematically and is thought to still have potential. The presented study focused on detailed sedimentary examinations of core data. In combination with seismic interpretation the study led to a revised depositional model helping to predict facies distribution and possible trapping configurations.
The studied sections record tide- to wave-influenced deltaic deposition with five facies associations being defined. They range from lower deltaplain to distal prodelta environment. First sequence stratigraphic approaches were done, revealing changes in deposition by relative sea-level change. Seismic imaging, wireline measurements and ichnologic analyses contributed further aspects to the interpretation.
The deltaic deposition consists of five environments: distal prodelta, proximal prodelta, reworked deltafront, proximal deltafront and the lower delta plain. The distal prodelta is characterized by thick-bedded fine-to medium-grained sandstone fans of turbidity origin. They are inter-bedded by laminated to disorganized mudstones. The ichnogenera are restricted to muddy intervals and comprise single *Taenidium* and *Planolites*. The deposits of the proximal prodelta environment are marked by domination of laminated mudstones. They intercalate with thin beds of cross-laminated turbidity sandstones which are occasionally wave-reworked. Furthermore, single thick-bedded tempestite sandstones occur. The trace fossil suite comprises major *Taenidium, Planolites, Teichichnus* and escape structures. Wide-spread deposits of reworked and redeposited deltafront sands are medium-grained, normal-graded and massive to structured in habit. They show fluid escape and lack in ichnofabrics. The proximal deltafront environment is characterized by flaser-bedded fine sandstones that intercalate with laminated mudstones. The deposits display coarsening-upward trends and show moderate to intense bioturbation by *Taenidium* and *Planolites* mainly. The deposits refer to reworked mouthbar deposits. The lower delta plain environment is marked by massive, normal-graded, coarse- to medium-grained sandstones, thick sequences of laminated mudstone/ sandstone and slumped muddy sandstones. They record deposition in the „terminal" distributary channel which was place of tidalite formation occasionally.
The facies evolution from lower to upper Hall Formation points to the shallowing of the Paratethyan basin in the Burdigalian. In Eggeburgian times, that development cumulated in the formation of a tidal- and wave-influenced deltaic system. This system is sourced by clastics from the active Alpine orogeny. In contrast to earlier Burdigalian times with contributor-feeder channels further in the west (Inn/Traun Valleys), this system seems to be fed mainly from the Salzach valley. It prograded to the northeast forming various potential reservoirs.

Diagenetic alteration in sandstones of the gas-, water-, and transition- zone of a gas reservoir, Molasse Zone, Austria

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Sandstones of the studied Miocene gas reservoir are resedimented deposits from the southern slope of the Austrian Alpine Molasse Basin. Reservoir rocks are heterogeneous medium- to coarse grained sandstones containing large clasts of shales and carbonates. The gas reservoir has been produced and is now used for underground gas storage. To better understand the mineralogy of the reservoir sandstones with respect to the different zones (gas-, water- and transition zone) and the effect of drilling fluids to the formation, multiple analyses were carried out.
Diagenetic alterations in the sandstones are feldspar overgrowths on detrital K-feldspar grains; authigenic quartz overgrowths;