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Along-strike variations of structural styles in the imbricated Molasse of Salzburg and Upper Austria: a 3-D seismic perspective

Ralph Hinsch and Hans-Gert Linzer
RAG – Rohöl Aufsuchungs AG, 1015 Vienna, Austria (ralph.hinsch@rag-austria.at)

At the southern border of the Northern Alpine Foreland Basin syntectonic deposits (Molasse Sediments) are partly incorporated into Alpine contractional deformation. Along the alpine chain style and timing of this deformation varies significantly. In this study we use one of the largest European on-shore 3-D seismic datasets, spanning the Molasse basin of Upper Austria and Salzburg states, to investigate the along-strike structural architecture of the alpine deformation front.
In the Austrian Part of the Molasse basin, foredeep sedimentation started in Upper-Eocene times (Wagner, 1996). The sediments cover the European margin, consisting of a crystalline basement covered by variously thick Mesozoic sediments (Nachtmann und Wagner, 1987). In Oligocene to Lower Miocene times, syntectonic foredeep sedimentation took place in a deep marine environment, comprising an axial channel system (Linzer 2001, DeRuig and Hubbard, 2006). Parts of these syntectonic sediments are subsequently affected by the advancing thrust wedge. Within the study area, three distinct fold-and-thrust belt segments of different structural architecture can be defined.
1) The Perwang Imbricates are a promontory mostly situated in Salzburg at the border to Germany. Complexly deformed small thrust sheets evolve above a detachment horizon situated in Late Cretaceous shaly marls in Oligocene times. Syntectonic piggy-back and thrust top basins evolve (Covault et al. 2008), which are partly affected by subsequent Miocene overthrusting. 2) The Regau Segment is the area west of the Perwang lobe. It is dominated by few number of thrust sheets in the Molasse sediments. Instead, over-thrusting by the alpine wedge (pre-deformed Flysch and Helvetic thrust sheets) dominates. 3) The Sierning Imbricates segment is located further to the east, at the border of Upper Austria to Lower Austria. The structural inventory of this thrust belt is comprises varying numbers of thrust sheets along strike (1-5), ramp-flat-ramp geometries, tear faults as well as belt-parallel strike-slip faults.
The differences in structural style along strike are interpreted to be caused by pre-deformational conditions (sediment thickness and distribution of potential decollement horizons) and varying tectonic pulses.

Covault, J.A., Hubbard, S.M., Graham, S.A., Hinsch, R. and Linzer, H., 2008, Turbidite-reservoir architecture in complex foredeep-margin and wedge-top depocenters, Tertiary Molasse foreland basin system, Austria, Marine and Petroleum Geology, V26/3, 379-396

De Ruig, M. J., and Hubbard, S. M., 2006. Seismic facies and reservoir characteristics of a deep marine channel belt in the Molasse foreland basin. AAPG Bulletin, v. 90, p. 735–752

Linzer, H.-G., 2001, Cyclic channel systems in the Molasse foreland basin of the Eastern Alps- the effects of Late Oligocene foreland thrusting and Early Miocene lateral escape. AAPG Bulletin, 85, 118.

Nachtmann, W., Wagner, L., 1987.Mesozoic and Early Tertiary evolution of the Alpine Foreland in Upper Austria and Salzburg, Austria. Tectonophysics, 137, 61–76

Wagner, L. R., 1996. Stratigraphy and hydrocarbons in the Upper Austrian Molasse Foredeep (active margin). In:Wessely, G., Liebl, W. (Eds.), Oil and Gas in Alpidic Thrustbelts and Basins of Central and Eastern Europe. EAGE Special Pub. 5, pp. 217–235.