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The Weyrer Arc of the Northern Calcareous Alps fold-and-thrust belt: an inherited salt basin edge on a passive margin?

Pablo Granado (1), Philipp Strauss (2), Josep Anton Muñoz (1), Klaus Pelz (2), Eduard Roca (1), Elizabeth P. Wilson (1), Wolfgang Thöny (2), Michael König (2), and Herwig Peresson (2)

(1) Institut de Recerca Geomodels, Departament de Dinàmica de la Terra i de l'Oceà, Facultat de Ciències de la Terra, Universitat de Barcelona, Martí i Franquès s/n, 08028 Barcelona, Spain (pablomartinez_granado@ub.edu), (2) OMV Austria Exploration and Production GmbH, Trabrennstrasse 6-8, 1020, Vienna, Austria

Arcuate segments in fold-and-thrust belts have always caught the attention of geologists. In the eastern Northern Calcareous Alps of Austria the prominent Weyrer Arc has been described for several decades. However, its formation and timing have comparatively received less attention. The Weyrer Arc is detached in Permian-Triassic salt and fundamentally involves Triassic and Jurassic carbonates deposited on rift to passive margin settings. Although convergence dominated from mid Cretaceous to Middle Miocene times, syn-orogenic strata in this part of the fold-and-thrust belt are scarce, and limited to mid Cretaceous-Paleogene sediments in the frontal most units of the arc's footwall. The present geometry of the arc is asymmetrically parabolic, with a prominent change in structural orientation from the regional ENE-trend, to a N- to NNW-trend to the west. The leading edge of the arc is around 72 km long, and overthrusts EW-striking structures to the W and NW; its largest map-view amplitude is about 22 km. Internally, structural trends converge towards the southernmost endpoint of the salient with marked changes in structural wavelength and sedimentary thickness; geological contacts can repeat or omit stratigraphy, and are frequently associated with severely deformed Permian-Triassic evaporites and steep to overturned bedding. These features are in marked contrast with nearby thrust sheets extending for tens of kilometers along strike, showing little thickness variations and classical thrust relationships of hanging-wall flats on footwall ramps.
In this work we integrate existing geological data (maps and well data) with new field mapping results to present serial cross-sections to illustrate the structural style variations along and across the arc. These variations denote changes in the depositional thickness of the Permian-Triassic salt and its influence during passive margin thin-skinned stretching on the distribution of mini-basins, platforms and intervening salt structures. A framework to discuss the nature and origin of the Weyrer Arc is provided.