Structural development of the Austro-Alpine continental margin, NW Tauern Window, Eastern Alps

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The ophiolitic and blueschist-bearing Geier-Reckner complex (GRC) is the topmost unit within the Lower Austroalpine nappe complex (LAA), which is now exposed at the top of Penninic units (PN) of the Tauern Window (TW). The LAA includes continental basement, the Innsbruck Quartzphyllite (IQ), and the continental Hippold (HN) and Reckner nappes (RN). The GRC includes mantle rocks formed during Jurassic asymmetric rifting in the Penninic oceanic domain. The HN containing HP phengites represents a former tilted block which was subducted during the Paleogene.

Footwall thick-skinned thrust propagation caused nappe stacking in a highly ductile regime during the Eocene as follows: (1) Overriding of the GRC on top of the RN; (2) overthrusting of the RN and GRC onto the HN; (3) overthrusting of the GRC, RN and HN onto the IQ and (4) nappe stacking of the entire LAA over the PN. These thrusts are associated with the formation of two penetrative deformations, D1 and D2, displaying a displacement from E to W, where D2 structures are characterized by isoclinal recumbent folds. The RNC encompassing serpentinites and Mesozoic deep-marine sediments display, at present such a recumbent isoclinal fold of at least 600 metres structural thickness. D3 and D4 deformation resulted from further orogenic shortening in N-S direction. Extension during updoming of the TW is responsible for formation of late-stage normal faulting marked by slickensides (D5). D6 N-trending veins and joints are related to the youngest movements along and within the hangingwall units of the TW.