

TECTONICS OF THE EASTERN TAUERN WINDOW - AUSTRIA

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The eastern Tauern Window (TW) exposes the following top to bottom sequence of nappes: Austroalpine units; Glockner Nappe (GN, derived from the Valais branch of Alpine Tethys); Rote Wand-Seidwinkl (RS) isoclinal fold nappe with normal and inverted stratigraphic sequences of the most distal European margin; GN refolded around RS; and Sonnblick basement and cover (SO). The SO unit is the highest nappe of the Venediger Duplex (VND) derived from the European continental margin. The contact of the GN with the RS is a D1 thrust that was subsequently folded into an isoclinal D2 antiform, which we tentatively interpret as a crustal-scale, N-facing sheath fold. We further observe that the GN underlying the RS is in thrust contact with the SO, but that in the Mallnitz area the RS is missing between the GN and its D1 contact with the VND. There, this folded contact is cut by D3 thrusts and further deformed by the D4 Hochalm Dome.

From existing and own maps, we discern the following deformation events: (D1) thrusting of the GN onto the RS; (D2) isoclinal folding of the D1-detached RS and overlying GN brought the GN into the inverted limb of an D2 antiform whose core comprises the RS unit; (D3) formation of the VND whereby the previously stacked and folded RS-GN composite unit overlies the roof thrust of this duplex structure; (D4) doming (Sonnblick, Hochalm), tight folding (Mallnitz Synform) and sinistral shearing as part of the Katschberg Shear Zone system (KSZ, Scharf et al., this vol); (D5) dextral brittle strike slip faulting along the Mölltal Line overprints D4 structures, but does not extend NW-ward into the central TW. D1 – D2 are inferred to have occurred during Eocene subduction and exhumation of the European margin and adjacent GN, based on a correlation of D1 and D2 schistosity and stretching lineations with late Eocene (42-32 Ma) HP mineral assemblages in the RS. D3 is attributed to incipient collision of the Adriatic margin (upper plate) and previously accreted RS and GN units with the European margin (lower plate). D4 doming and lateral E-W extension accommodated by the KSZ is a response of the thick orogenic wedge both to Neogene indentation of the Adriatic plate and to ESE-directed pull of the retreating European slab in the Carpathians. Exhumation between 25 and 17 Ma was caused by significant erosional unroofing.