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The Strudengau Shear Zone; a new Late Variscan low–angled ductile shear zone in the S Moldanubian Zone (Austria)

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The Variscan Moldanubian Zone in Austria is divided from E to W into three lithological units: Gföhl, Variegated and Monotonous units. In the Amstettener Bergland and Strudengau area (Lower Austria), important new late- to post-Variscan deformation has been observed. Between Persenbeug and Weins, a low-angled mylonitic shear-zone (Strudengau Shear Zone) has been mapped for over 2 km, with a thickness of 0.3 – 1.5 m. Shear-sense criteria, observed in both the field and thin-sections (shear-zone asymmetry, clast geometry, and quartz CPO) indicate a top NW sense of shear. The Strudengau Shear Zone lies in the Monotonous Unit and cross-cuts older structural pattern in the HT/LP metamorphic rocks and dykes which intruded the metamorphic nappe stack. The HT/LP metamorphic rocks, mainly ortho- and paragneisses, have steeply dipping foliation planes with SE-NW trending lineations, showing top SE kinematics. Dykes with variable mineralogies and chemical compositions have pre- and post-mylonitic cross-cutting relationships to the Strudengau Shear Zone. The shear zone mylonites have parageneses indicative of the lower amphibolite facies (Pl + Kfs + Bt + Ms + Qtz), with relict Ky/Sil. Syn- to post-tectonic chlorite grew parallel to the mylonitic foliation; this is interpreted as a greenschist-facies overprint during ongoing mylonitisation and exhumation in a regional W-E extensional system. In addition, brittle-ductile to brittle high-angle fault-patterns around the mylonites display an essentially NW-SE trending maximum compressive stress. Quartz shear bands indicate a lower temperature deformation, towards the brittle-ductile transition. Reactivation of the brittle structures during Alpine orogeny is likely.