POLYPHASE DEFORMATION IN HIGH-GRADE VARISCAN DOMAINS OF THE SE-BOHEMIAN MASSIF: IMPLICATION FOR TECTONIC EVOLUTION OF A DEEPLY ERODED COLLISIONAL BELT

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A detailed structural and petrographical investigation was performed in the Moldanubian zone in the southeastern Bohemian Massif (Lower Austria). From tectonic hangingwall to footwall the nappe stack of high-grade rocks in the study area consists of granulites and gneisses (Blumau Granulite Complex) underlain by the Raabs Serie and the Drosendorf Unit. The Drosendorf Unit is a continental terrane including metasedimentary units, the Raabs Serie contains rocks with oceanic affinity and the protoliths of the Blumau Granulite Complex are calc-alkaline magmatites, likely derived from island arcs. All units display different pressure – temperature – deformation paths. In order to constrain the tectonic and metamorphic history we elaborated data on successive deformation events linked with data on prevailing deformation mechanisms and lattice preferred orientation pattern (LPO) of quartz.

UHT and/or UHP conditions in the Granulite Complex are relictically preserved but not recorded in the structural evolution. High temperature, W-E coaxial flow at ca. 800°C in granulites is derived from disc-shaped quartz, quartz C-axes distributions with extreme opening angles and dominantly prism C glide. The high-grade fabric is refolded along W-E trending fold axes that are disconform to the underlying units. The present tectonic boundaries of the Granulite Nappe are discrete mylonite zones which developed at amphibolite grade conditions. The deformation in the Raabs Serie is characterized by general top-to-the NE transport coeval to migmatisation, overprinted by localized N-S shear. Internal portions of the Drosendorf Unit exhibit top-to-the NE flow at higher amphibolite facies conditions but lower grade deformation along the tectonic boundaries. Our data suggest that the different tectonic units took their current position comparably late in the Variscan history during flow along localized mylonite zones. The precursor histories display different peak metamorphic conditions that were achieved in different geodynamic settings.