2001). According to anisotropic parameters of body waves, we can distinguish several domains in the mantle lithosphere of the BM. While a large δt and a general E–W orientation of the fast split wave prevail in the western and central parts of the BM, the δt in the eastern part is smaller and the fast polarization rotates to the WNW–ESE direction (Fig. 2). The null split solutions or a decrease in the split times are related to the ST/MD contact in the western part of the BM and in the eastern Moldanubian around longitude 15.5°E (see the BM1 station in Fig. 2). The latter lateral change is associated with the effects caused by wave propagation within the complex mantle lithosphere formed by the Brunovistulian domain (e.g., Gnojek and Hubatka, 2002) underthrust beneath the eastern MD. The P residual spheres indicate that there is no substantial difference between the velocity structure of the mantle lithosphere beneath the MD and the Teplá-Barrandian Unit (TBU). But the spheres indicate that the velocity structure of the northern part of the BM differs from that of the MD. We interpret the observed variations of the anisotropic parameters by olivine models with generally orientated (dipping) symmetry axes. While the (a,c) foliations dip mostly to the NW in the ST and Sudetes, they dip to the S in the MD. As shown by lateral changes in the anisotropic parameters, the mantle lithosphere of the BM, similarly to other Variscan massifs such as the Armorican Massif (Judenherc et al., 2002) or the French Massif Central (Babuška et al., 2002), consists of at least three domains with different orientation of large-scale olivine fabric separated by sutures cutting the whole lithosphere.

Acknowledgements

The research was partly supported by grant projects 205/01/1154 of the Grant Agency of the Czech Republic, A3012908 of the Grant Agency of the AS CR and 128/630/01 of the Ministry of the Environment of the Czech Republic.

References

BABUŠKA V. and PLOMEROVÁ J., 2001. Subcrustal lithosphere around the Saxothuringian-Moldanubian Suture Zone – a model derived from anisotropy of seismic wave velocities. *Tectonophysics,* 332: 185-199.

BABUŠKA V., PLOMEROVÁ J., VECSEY L., GRANET M. and ACHAUER U., 2002. Seismic anisotropy of the French Massif Central and predisposition of Cenozoic rifting and volcanism by Variscan suture hidden in the mantle lithosphere. *Tectonics*, 21: U407-U429.

GNOJEK I. and HUBATKA F., 2001. Structure of the Brunovistulian Unit (E part of the Czech Republic) on the basis of seismic and magnetic data. *Bull. Czech Geol. Survey*, 76: 157-168.

JUDENHERC S., GRANET M., BRUN J-P., POUPINET G., PLOMEROVÁ J., MOSQUET A. and ACHAUER U., 2002. Images of lithospheric heterogeneities in the Armorican segment of the Hercynian range in France. *Tectonophysics,* 358: 121-134.

PLOMEROVÁ J., ŠÍLENÝ J. and BABUŠKA V., 1996. Joint interpretation of upper mantle anisotropy based on teleseismic P-travel time delays and inversion of shear-wave splitting parameters. *Phys. Earth. Planet. Int*., 95: 293-309.

PLOMEROVÁ J., GRANET M., JUDENHERC S., ACHAUER U., BABUŠKA V., JEDLIČKA P., KOUBA D. and VECSEY L., 2000. Temporary array data for studying seismic anisotropy of Variscan Massifs – the Armorican Massif, French Massif Central and Bohemian Massif. *Stud. Geophys. Geodet.*, 44: 195-209.

Brittle Deformation of the Ernstbrunn Limestone (Jurassic) of the Pavlov Hills

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The Ernstbrunn Limestone is suitable for the study of the mechanics of brittle deformation. It represents the top member of the carbonate facies of the Ždánice Unit (Eliáš 1961, Matějka et al. 1961) of the Late Jurassic (Oxfordian) to

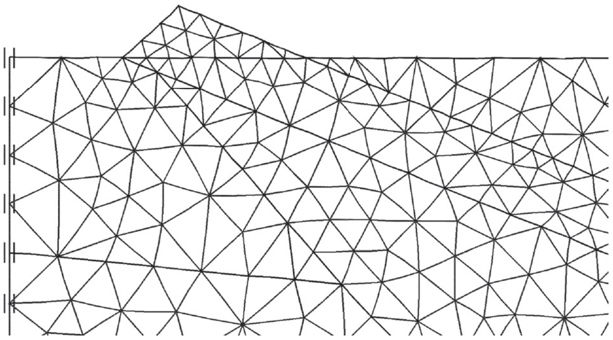

Fig. 1. Construction of primary triangles.

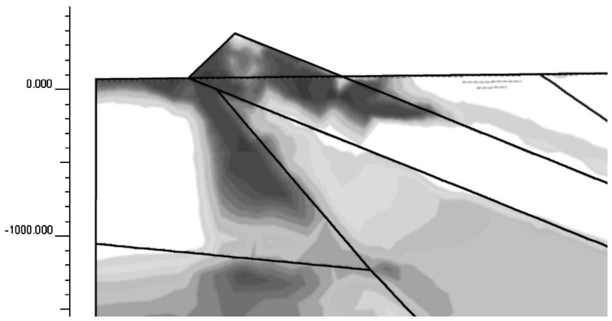

Fig. 2. Decomposition of stress.

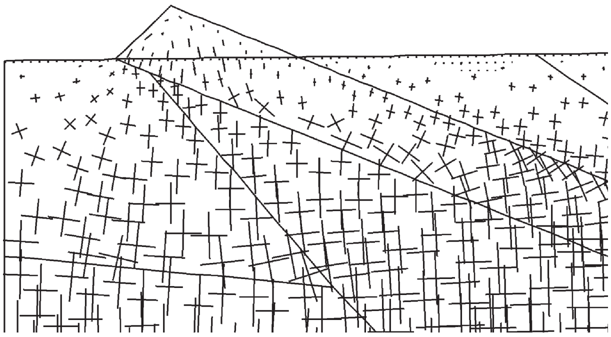

Fig. 3. Principal stress orientation.

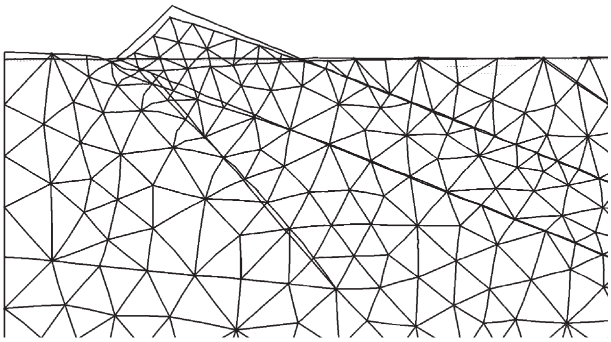

Fig. 4. Influence of rigid limestone desk on soft rocks.

Early Cretaceous (Hauterivian) age (Eliáš 1992). It is crosscut by a set of faults striking mostly W–E to SW–NE. The faults divide the limestone body into several morphological blocks. Inverse stress analysis indicates the presence of several phases of fault development. Older faults are characterized by striae on their surfaces, up to several tens of centimetres wide. Younger striae are finely spaced and oblique. Up to 5 different generations of striae on one fault plane could be distinguished.

Samples of the Ernstbrunn Limestones from the Mikulov surroundings were mechanically tested using the ZD10/90 VEB-TIR Rauenstein testing machine (DDR). The tested bodies were 9 cm high with cross-sectional area of 5×5 cm. The averaged rock strength under axial loading is 162.1 MPa with coefficient of internal friction 65.2°. Specific gravity of the rock is 2.65 g/cm^3.

The late tectonic deformation (loading) was studied by the finite element method (FEM) using the Plaxis 7.0 PC program. The cross-section of the studied area was divided in a set of elementary triangles (Fig. 1) and the whole matrix of deformation was obtained. The data can be visualized as decomposed stress (Fig. 2) or as principal stress orientation (Fig. 3). Subvertical loading after the thrusting of limestones over soft bedrock yielded a special strain effect (Fig. 4) in which the old inverse fault planes could be reactivated in normal sense of shear. These theoretical results are in agreement with the movements on the fault planes observed in the field.

References

ELIÁŠ M., 1962. Zpráva o sedimentárně petrografickém výzkumu klentnických vrstev a ernstbrunnských vápenců. *Zpr. geol. Výzk. v Roce 1961*: 196-198.

ELIÁŠ M., 1992. Sedimentology of the Klentnice formation and the Ernstbrunn Limestone. *Věst. Ústř. Úst. geol.*, 67, 3: 179-196.

MATĚJKA A. et al., 1961. Zpráva o geologickém výzkumu Pavlovských vrchů I. MS, Czech Geological Survey, Praha.

Structural and Metamorphic Evolution of Pro-Wedge Moldanubian Structures Associated with Underthrusting of Brunovistulian Foreland

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We investigate the orogenic fabric along the E-W cross-section at the eastern margin of the Moldanubian Zone in order to understand the mechanical behaviour during the formation and exhumation of this part of the orogenic root. The cross section is running from the Raabs lower crustal unit in the west, across the underlying Varied unit and the Podhradská unit to the easterly-situated Moravian Zone.

The structural observations show the succession of four fabrics. The relics of the first foliation S1 with unknown original orientation are preserved in form of tide to isoclinal folds within the steeply NW–dipping foliation S2 in the Varied and Podhradska units. The steep NW- dipping S2 fabric is reworked by E-verging close to isoclinal F3 folds with westerly dipping axial palanes and subhorizontal axes. This late folding results in places to almost complete transposition into the moderately west-dipping S3 foliation, developed with greatest intensity in the Raabs unit. The latest locally developed structure is a flat S4 fabric represented by LT shear zones.

In order to correlate the structural observations with P-T conditions, we have used the average P-T calculations to obtain absolute P-T conditions for the peak metamorphic assemblages. The qualitative PT-paths of the rocks from individual units ware deduced from PT-pseudosections constructed in the NCKF-MASH system for selected samples: migmatite from the Raabs