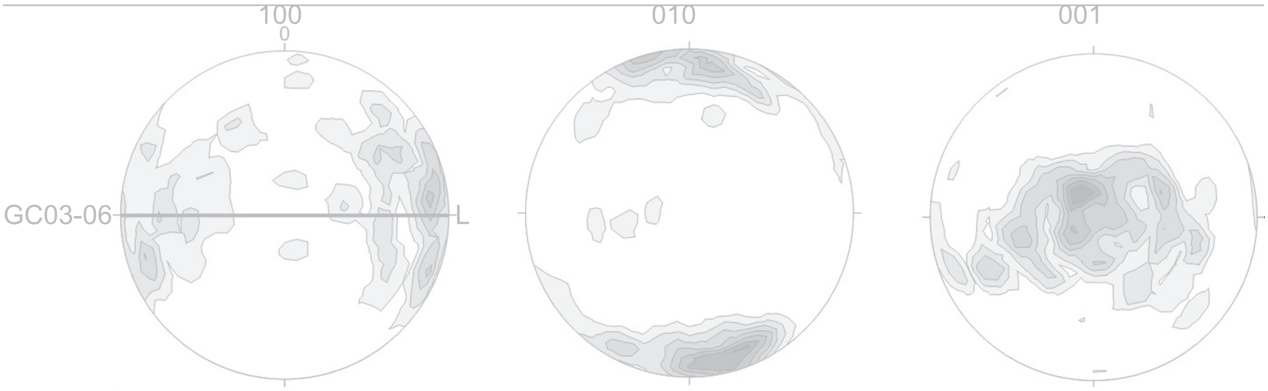

■ **Fig. 2.** Stereograms of olivine orientations in the xenoliths containing pyroxene-spinel symplectites from the LHPVF. 100 grains were analyzed. Note intermediate maximum of [100]axes and high maximums for [010] and [001]. Note marked girdle of (100) and (001) in foliation plane. Horizontal line denotes orientation of macroscopic foliation or compositional banding; L macroscopic lineation. Lower hemisphere, equal area projection. Data contoured at 1, 2, 3,... times uniform distribution.

roclasts contain exsolution lamellae of clinopyroxene and orthopyroxene, respectively. Clinopyroxene porphyroclasts also frequently contain spinel lamellae.

Orthopyroxenes and clinopyroxenes in the symplectite show higher MgO, FeO and CaO and lower Al_2O_3 contents than the cores of the porphyroclasts and they resemble the compositions of porphyroclast rims and neoblasts. Spinels in the symplectite are extremely rich in Al_2O_3 compared to host rock spinels, whereas their Cr_2O_3 content is significantly lower than that of the host rock spinels.

Mass balance calculation of the most pristine symplectites was carried out using NIH Image – on SEM images and the geochemical compositions gained from EPMA analysis. The calculation indicates that the symplectites are former garnets with high (~70 mol%) pyrope contents. However, trace element patterns of the mineral phases in the symplectite and the host mineral phases do not show any trace of garnet signature

The mutual application of calculated garnet compositions and recalculated orthopyroxene and clinopyroxene compositions (reentening exsolution lamellae), applying the method of Falus et al. (2000) can be used to calculate pressure and temperature conditions (Nickel and Green 1985) where these phases (garnet, homogeneous ortho- and clinopyroxene) were stable together.

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Structure of the Lithosphere in the West-Pannonian Basin, Based on CELEBRATION 2000 3D Seismic Data and Mantle Xenoliths

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Geophysical and geochemical research in the Pannonian Basin has provided several new results in the last decades. These achievements offer a complex and systematic opportunity to refine the basin structure and to more clearly understand some major steps in the formation and evolution of the region. This paper deals mainly with the regional tectonic zones and geological units, which determine the major structural architecture of the Pannonian Basin.

One of the most significant database regarding the Pannonian Basin is the dataset of the CELEBRATION 2000 project. This 3-D deep seismic experiment was carried out in Central-Europe including a part of the Pannonian Basin. Using the emerged database a 3-D seismic tomographic inversion of the whole crust can be achieved.

Potential field geophysical methods, although with restricted penetration depth, may also carry significant geological information. In the last decades not only the potential filed geophysical database has expanded, but the methodology of data evaluation has also extensively improved. Thus, reprocessing the expanded data may considerably contribute to the understanding of some important problems of the Pannonian Basin.

Besides geophysical methods, geochemical and microstructural analyses of xenoliths carrying direct information on the deep crust and upper mantle also play an important role in the complex understanding of lithospheric evolution. These analyses provide further independent reliable results concerning the studied portions of the basin. These results in the paper are interpreted together with tha data produced by geophysical methods.

Based on the analysis of the 3-D tomographic velocity field the Rába and Balaton Line should be interpreted as significant shear zones, which occur along the full depth range of the crust. Along-section force field measurements indicate these structural zones as density and susceptibility contrasts running from the base of the Pre-Tertiary to lower crustal depths. This result supports the interpretation of the zones being deep shear zones. Magnetic and gravity maps also indicate the Rába and Balaton Line as deep structural zones in accordance with the geological information. Furthermore, the force field measurements imply that the Zágráb-Zemplén Line could also be interpreted as a deep shear zone, moreover, the existence of several other deep structural zones is foreseen. Since the volcanic bodies indicated by the magnetic maps represent processes occurring at deep crustal or even mantle depth these data also support that the structures may run down to greater depth

Based on the coincidence of geophysical data, the interpretation of the analysis of the 3-D tomographic velocity fields can be confirmed. Thus, the Rába and Balaton Lines are deep shear zones cutting through the whole crust, whereas the TCR unit occurs on the result-section as an "individual body", suggestibly in autochthonous position, different from its environment in the full vertical thickness. Geochemical and microstructural analysis of mantle xenoliths not only supports these interpretations but expands them to the upper mantle. Therefore, the TCR can be inferred as an individual lithospheric scale unit, which is bounded on the North by the Rába-(Diósjenő-Hurbanovo) Line and from the South by the Balaton Line being shearzones running down to upper mantle depth. It still a matter of debate whether the TCR should be interpreted as a lithospheric fragment or a microcontinent. Shear zones with the suggested scale are mainly formed along horizontal displacement zones.

The tomographic sections do not indicate the Zágráb-Zemplén Line as a sharp feature. However, regarding force field geophysical and geological data this line is still inferred as a first order structural zone. Further, more detailed processing of the tomographic data (e.g., ray tracing inversion) could facilitate a more accurate imaging of the structural zone.

New Occurrence of Variscan Micaschists within the Jurassic Meliata Unite, Western Carpathians

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PT conditions of the middle Jurassic metamorphism in the Meliata rocks, exposed on surface, range from very low-grade through high-pressure greenschist to blueschist facies. Amphibolite facies rocks (garnet-hornblende gneiss and amphibolite from Rudnik and micaschist from Zadiel) occurring in the eastern part of the Meliata are interpreted as fragments of older basement unit that were dragged down along the subduction zone. Variscan age of these rocks was confirmed by Ar^{39}-Ar^{40} data (Faryad and Henjes-Kunst 1997) in muscovite from micaschists in Zadiel. Both amphibolite with gneiss and micaschist reveal clear evidence of blueschist facies overprint.

The micaschists studied here come from the western part of the Meliata unit and occur between Nižná Slaná and Hanková. They are characterized by the presence of large (up to 5 cm) columnar crystals that have random orientation in the rock. The spectacular large crystals are formed either by pseudomorphs of chlorite with relicts of hornblende or by glaucophane. The rock with hornblende has relatively high amounts (10 vol%) of epidote, which mostly form inclusions in white mica. All analyzed Ca-amphiboles are tschermakite near to pargasite with Si = 6.3 a.p.f.u., where A sit is occupied by near 0.5 a.p.f.u. and $X_{Na} = 0.23-0.27$. White mica is muscovite (Si ~ 3.15 a.p.f.u.) with high paragonite solid solution ($X_{Na} = 0.14-0.17$).

The samples with glaucophane have high amounts of quartz and contain idiobalstic garnet. Some garnet grains are enclosed by glaucophane. The large glaucophane crystals with fine-grained inclusions of epidote seem to be pseudomorphs after hornblende that might associated with garnet. Both micaschist varieties contain large (up to 1 mm) rutile crystals. Beside muscovite with relatively high paragonite solid solution, this rocks additionally has phengite (Si = 3.45 a.p.f.u.) with $X_{Na} = 0.04$. Garnet is rich in Fe and Ca with low Mn content (Alm_{62}, Grs_{23}, Py_9, Sps_5).

The studied micaschists occur adjacent to mafic blueschists, but their contact is not exposed. Minerals present in the blueschists are glaucophane, epidote, albite and chlorite. Some phyllites additionally contain quartz, phengite and rarely also paragonite and garnet. Comparing to micaschist, garnet in phyllite is strongly zoned with higher Mn and low Fe and Mg in core (Alm_{33-62}, Grs_{21-35}, Sps_{6-33}). PT conditions estimated based thermodynamic data of Berman (1988) and PTGIBS program of Brandelik and Massonne (2004) for the