in the NE part of the Bohemian Massif by the seismological stations operated by IPE (Institute of Physics of the Earth, Masaryk University Brno).

The most frequent occurrence of the micro-earthquakes is observed in the area northwards of Šternberk. In the period 15. 11. to 19. 11. 2005, new swarm-like sequence of the tectonic events was observed in the area NW of Šterberk. The stations of IPE detected 33 events (the local magnitude ML of strongest events was 1.4) belonging to this sequence. Seismo-tectonic activity occurred also in some other areas near Šternberk, the sequence of micro-earthquakes including the event with local magnitude ML = 2.2 was detected in December 2005 in the area eastwards of Šternberk.

Significant seismo-tectonic activity was observed in the Hronov region. In this region, the strongest micro-earthquake (local magnitude ML = 2.8) occurred on 25. 10. 2005. The swarm-like sequence of weak events (five registered events with local magnitudes ML varying from 1.0 to 2.2) observed on 10. 8. 2005 represents another occurrence of the relatively significant seismo-tectonic activity detected in the Hronov region during the year 2005.

Other relatively significant exhibitions of the seismo-tectonic activity occurred in the areas near Bruntál, Budišov n. Budišovkou, Opava, and Hranice na Moravě in the period 2004–2005. Epicentres of 15 micro-earthquakes recorded in the period 20. 8. to 29. 8. 2004 and located into area near Hranice na Moravě (the local magnitude ML of strongest events was 0.9) are situated in the Western Carpathian flysh nappes, close to the front of these nappes. But, in respect of the depth of hypocenters which exceeds 10 km, the seismic activity occurs in the units of Bohemian Massif forming the basement of the Western Carpathian nappes, which have thickness of only 1–2 km in this area (for instance Menčík et al. 1979).

Also seismo-tectonic activity newly observed in the Vizovice region (18 events detected in the period 14. 3.–6. 7. 2004, the local magnitude ML of strongest events was 1.3) is probably connected with the faulting in the units of the Bohemian Massif under the Western Carpathian flysh nappes. The thickness of the Western Carpathian nappes reaches about 6 km in this region (for instance Menčík et al. 1979). The calculated depths of the located hypocentres vary from 12 to 16. These depths correspond to the hypothesis, that the hypocentres are situated in the basement formed by the Bohemian Massif, close to the base of the Western Carpathian nappes. But the determination of the depth is less accurate in comparison with determination of other coordinates.

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# Geodynamic Implications of Flattened Equigranular Textured Peridotites from the Central Part of the Carpathian–Pannonian Region

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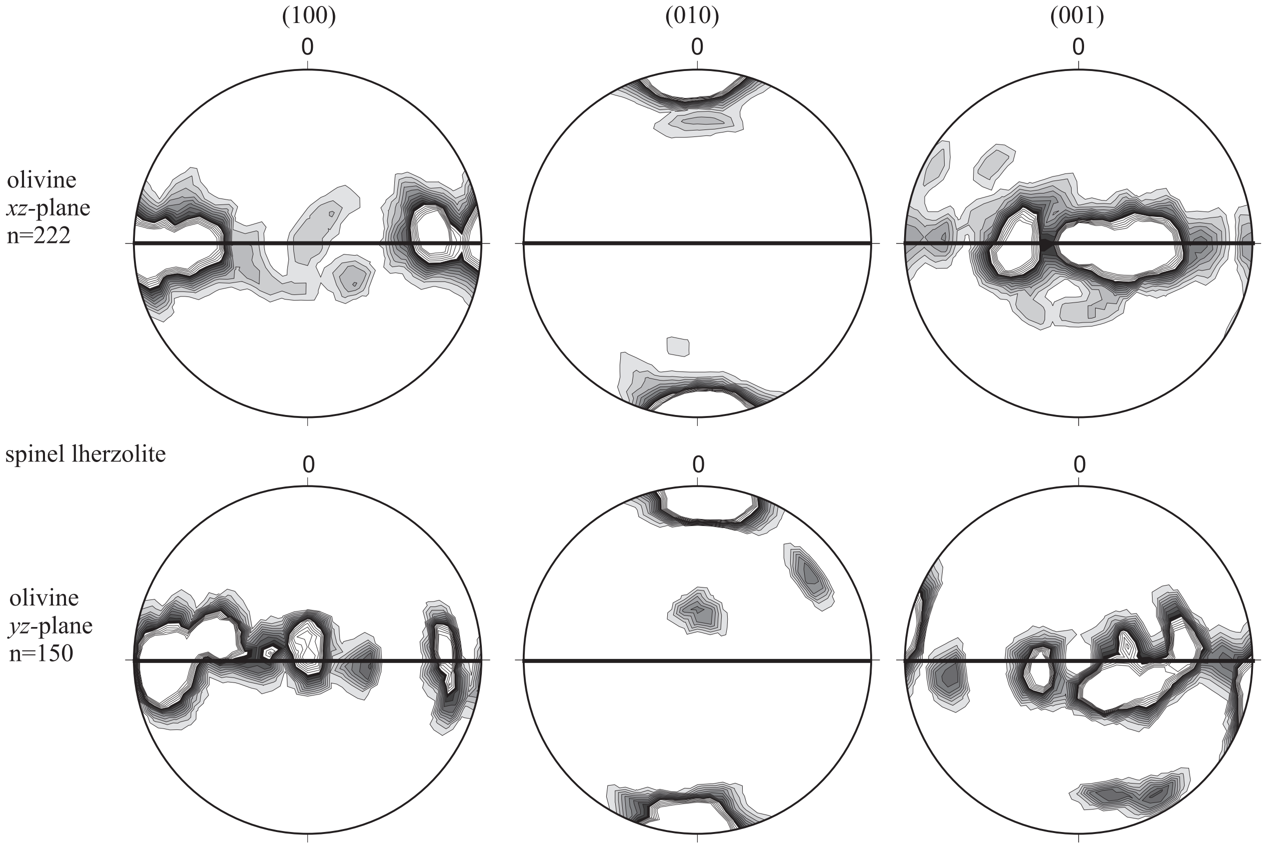
Peridotite xenoliths showing unusual tabular equigranular texture (addressed as flattened equigranular) were found in Neogene alkali basalts from the Bakony-Balaton Highland Volcanic Field (BBHVF), in the central part of the Carpathian-Pannonian Region. In this study we present a basic (major and trace element) geochemical, detailed fabric (polarized light microscope and computer tomography /CT/) and EBSD analysis of CPO of both olivine and orthopyroxene in three flattened equigranular textured peridotite xenoliths selected for this study.

Macroscopic foliation and mineral lineation in the studied upper mantle rocks are visible in hand specimens being defined by flattening and stretching of all mineral phases, respectively. On the CT images, foliation is also shown in 3D by the olivines. Regarding their textural type, the studied xenoliths are not common in the BBHVF and were reported extremely rarely among the worldwide-studied upper mantle peridotites. The petrographic features and uniqueness of the observed texture inspired us to address it flattened equigranular texture.

As a geochemical summary of the studied peridotites, based on their major element composition, they went through high degree partial melting (20–25 %), which is higher than the usual observed in common upper mantle peridotites of the BBHVF




■ **Fig. 1.** Crystallographic preferred orientation (CPO) patterns of olivine in a studied spinel lherzolite xenolith. Horizontal black lines denote the foliation, the lineation at 90°/0°. The thin sections had been cut oriented in xz- and yz-planes (i.e. perpendicular to the foliation and parallel to the lineation). Sectioning inaccuracies were corrected by rotating the data. Pole figures are lower hemisphere, equal area projections. n: number of grains measured by EBSD.

(~20 %) (e.g., Downes et al. 1992, Embey-Isztin et al. 2003, Szabó et al. 2004). Furthermore, the mg#s of the pyroxenes and olivines in the common rock types of the BBHVF are usually lower (89–90) than those of the studied xenoliths (91–92), which correspond to the above mentioned higher degree of partial melting observed in the studied peridotites. Therefore, this depletion is also confirmed by the high orthopyroxene/clinopyroxene ratio (3–4) in the studied xenoliths, which means significant clinopyroxene loss during partial melting. The trace element composition of the xenoliths studied suggests similar geochemical evolution (early depletion followed by different degree enrichment in light rare earth elements).

The olivines have a characteristic crystallographic preferred orientation (CPO) with [010]-axes perpendicular to the foliation and the [100] and [001]-axes forming a continuous girdle in the foliation plane (Fig. 1). Contrarily, the CPO pattern of orthopyroxene is much more scattered, although a double maximum can be observed in [001] planes parallel and perpendicular to the plane of lineation (Fig. 2). In case of olivine, the activation of multiple slip systems: (010)[100] and (010)[001] is suggested. The deformation micro-mechanisms of orthopyroxenes are suggested to be a combination of intracrystalline glide on the (100)[001] system and some kind of other mechanism resulting in quite scattered patterns. We suggest that the unusual orientation patterns of olivines and orthopyroxenes are the result of the complex tectonic evolution of the region. The flattened equigranular xenoliths could represent a structural domain within the subcontinental lithospheric mantle beneath the volcanic field with particular seismic characteristics.

The occurrence of flattened domains in the upper mantle may considerably influence the percolation and residence time of mantle melts and fluids, which could promote or prevent melt/wall-rock interaction. Furthermore, the studied upper mantle xenoliths may provide insight into anisotropic nature of the lithospheric mantle beneath the central part of the Carpathian-Pannonian Region. We suggest anisotropic nature is very likely associated with the tectonic evolution of the Carpathian-Pannonian Region.

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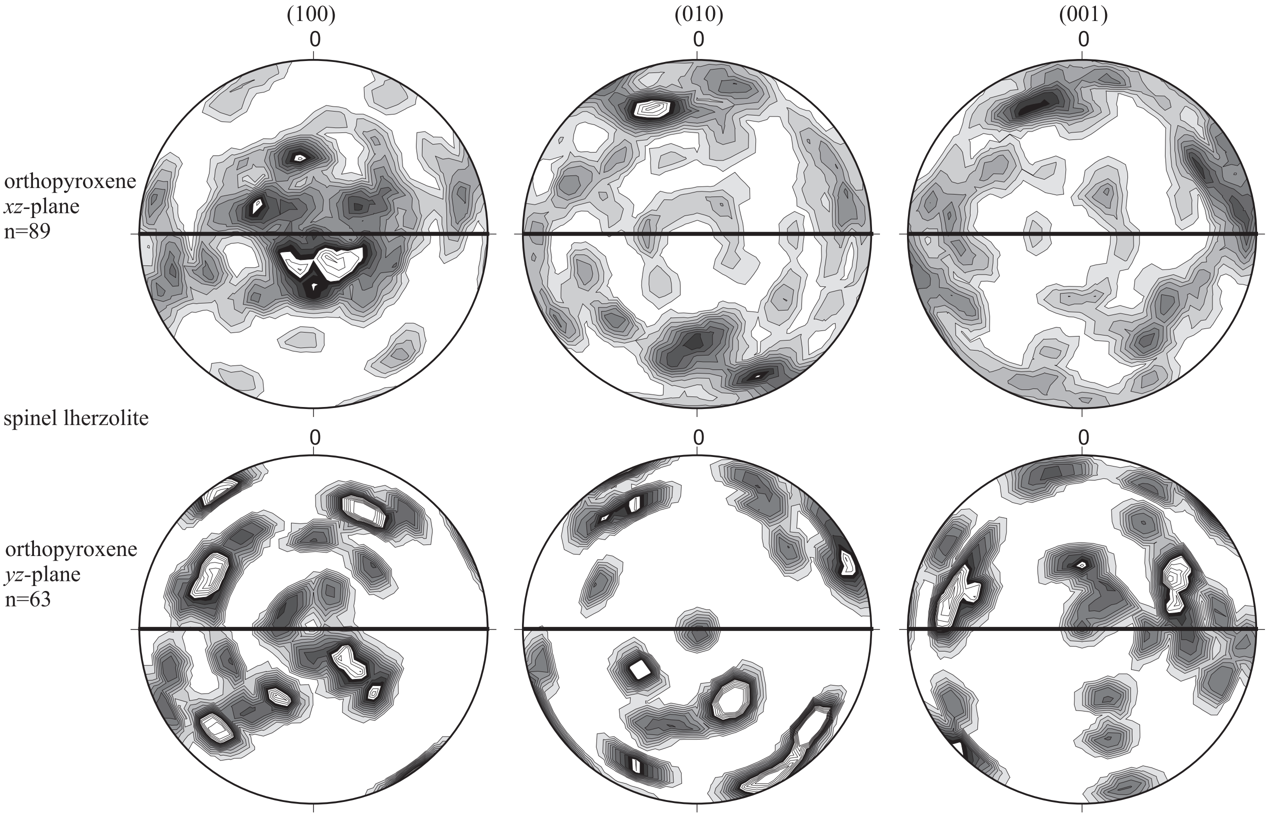


■ **Fig. 2.** Crystallographic preferred orientation (CPO) patterns of orthopyroxene in a studied spinel lherzolite xenolith. Horizontal black lines denotes the foliation, the lineation at 90°/0°. The thin sections had been cut oriented in xz- and yz-planes (i.e. perpendicular to the foliation and parallel to the lineation). Sectioning inaccuracies were corrected by rotating the data. Pole figures are lower hemisphere, equal area projections. n: number of grains measured by EBSD.

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# Magnetic Fabric and Ductile Deformation Differences between the Magura and Krosno Groups of Thrust Sheets of the Flysch Belt of the West Carpathians and their Tectonic Implications

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The magnetic fabric in sandstones of the thrust sheets of the Western Sector of the Flysch Belt of the West Carpathians ranges from essentially sedimentary to mostly deformational in origin. In the thrust sheets at the margins of the Flysch Belt (Outer Krosno–Menilite Flysch in the west and Bílé Karpaty unit and Oravská Magura unit in the east), the magnetic fabric is mostly sedimentary in origin, the ductile deformation being very weak, hardly detectable by magnetic anisotropy.