Summary

Peridotites occuring in orogenic massifs provide important insights into geochemical processes of the Earth's upper mantle by providing direct evidence of mantle evolution throughout Earth history. It has been previously demostrated (e.g. Medaris et al., 1990, 2005) that the uppermost tectonic unit of the Bohemian Massif - the Gföhl Nappe hosts a variety of peridotites that originated from different sources, including subcontinental lithosphere, suboceanic asthenosphere, and possible ultramafic layered intrusive complex. The Czech peridotites of the Gföhl Nappe has been divided into three groups, defined by Medaris et al. (1999), according to their chemical compositions, identity and relations of the aluminous phases, ortopyroxen compositions and estimated P-T conditions.

According to Medaris et al. (2005) „Type I" peridotites – represented by Mohelno and Biskoupky bodies – equilibrated in low P-T regime (recording the highest equilibration temperatures - up to 1335 ^{0}C at 29 kbar - among the Gföhl peridotites) consist of spinel peridotite with garnet appearing only at its margins. Peridotites are enclosed in granulites that have been extensively recrystallized mostly at amphibolite-facies conditions. Many studies have been done on this locality and a wide range of mineralogy and P-T histories has been documented by numerous authors, however source and evolution of the Mohelno-Biskoupky peridotites remain unclear.

The observed petrographic characteristics and mineral chemistry are mostly consistent with the scenario proposed by Medaris et al. (2005). In the behavior of the trace elements however, we observed two different trends: the more common feature is identical to that described by Medaris et al. (2005), 2 samples out of 10, however, showed considerably different behavior regarding the mantle normalized abundances of REE (LREE-enriched patterns). The observed modal composition (relatively high abundance of clinopyroxene) and LREE-enriched PUM-normalized patterns of 2 samples out of 10, doesn't seem to correlate with the oceanic-astenospheric origin suggested by Medaris et al. (2005).

The uniform Os concentrations detected in the samples (only slightly higher than PUM) are consistent with the low variation of the other I-PGE (Ir and Ru) abundances. On the other hand, significant deviations of the $^{187}Os/^{188}Os$ ratios (ranging from subchondritic to suprachondritic) indicate that at least some parts of the Mohelno-Biskoupky body were affected by metasomatism, which has resulted in higher $^{187}Os/^{188}Os$ ratios. In addition, the great variability in Re abundances is also likely to indicate a metasomatic history or melt-rock interactions, which have led to Re re-enrichment of these peridotites.
Based on the described behavior of the trace elements and HSE distribution, it is likely that Mohelno-Biskoupky undergone partial melting and/or basaltic melt metasomatism, the pattern which is usually recorded by orogenic lherzolites rather then abysal peridotites.