component directed WNW, acquired probably in Late-Jurassic/Cretaceous times. A younger ENE direction of Tertiary age has previously been reported from Western /South Western and Northern Greece. In order to further extend this dataset, we have sampled systematically along the Greek Pelagonian and Sub/ Pelagonian zone. Emphasis was placed on the Vourinos and Orthrys ophiolites and nonophiolitic accompanying sediments and lavas.

The Vourinos Ophiolite is one of the best documented ophiolitic complexes on global scale. It comprises a continuous ~12km thick Jurassic lithospheric section relatively unbroken by late intraformational tectonism. The entire pseudostratigraphic section, in today's geologic setting, is oriented (from east to west) steep westward dipping – vertical – overturned to east-dipping. Much of the rotation of this lithospheric section occurred previous to the upper Cretaceous, and an internal "bowing" in the ophiolitic section could represent inhomogeneous strain recorded during transport from spreading center to initiation of obduction. The sampling localities in Vourinos represent two depths within the oceanic lithosphere and a later, post-emplacement, formation.

The Jurassic-aged Orthris ophiolite is a thrust disrupted lithospheric section. A continuous section is lacking, though some nappes include over-lapping pseudo-stratigraphic elements. None of the composite nappes are overturned, and a reverse lithospheric-stratigraphic order is observed. The entire nappe sequence is emplaced above older lava-sediment sections and in the east, the Pelagonian margin. Western Othris, like the Pindos ophiolite, is in its entirety re-thrust above the Pindos flysch (late Cretaceous – Eocene). This latter backthrust occurred approximately 100 My later than the original ophiolite obduction.

In many areas, the standard palaeomagnetic and rock magnetic procedures revealed the presence of westward directions grouping around $D=330^0$. Secondary overprints correspond to the Tertiary clockwise rotation and often masked the older component. Inclinations are very low for the Permo-Triassic, implying an almost equatorial position for the area, in contrast to the ones corresponding to Jurassic / Cretaceous which are not far from the present position.

These results, together with previous research, are analyzed within the geotectonic framework of the broader area, providing an opportunity to compare palaeomagnetic directions during different stages of ophiolite emplacement.

Magnetic signature of plutons and implications for emplacement conditions: examples from Northern Greece

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The magnetization of batholiths is often unstable as a result of slow cooling and unroofing during their formation. These factors favour crystallization of coarse grains and mineralogical changes. Nevertheless, numerous studies have revealed the existence of stable magnetic recordings in batholiths, which can help to unravel the history of the pluton as far as its stability, translation or tilting is concerned. When an accurate isochron is established, it is possible to date the magnetic components through to blocking temperature spectra since isotopic and magnetic closure temperatures can be compatible. Finally, additional examination of other geophysical data and estimation of cooling rates can help the detection of burial conditions of the pluton. The majority of the above conditions apply successfully to large plutonic bodies. The present study focuses on Tertiary plutons in Northern Greece, covering more than 1200 km^2, classified from intermediate to large (70-430 km^2), where extensive paleomagnetic and rock magnetic studies were carried out. Accurate radiometric ages are available for all studied plutons. The new data (Symvolo and Vrondou), along with previously published results (Elatia, Samothraki, Sithonia, Symvolo, Vrondou and Xanthi) compiled a detailed paleomagnetic dataset which constitutes an important step towards distinguishing local rotations from the regional ones. The mean direction values from nearby volcanics were also used in the compilation for an additional test. A major point of attention for this study was the establishment of reliable inclination values, which would reflect the latitudinal variations, if important tiltings could be discarded. Thus, we scrutinized all palaeomagnetic results, by a closer examination at the site level and in comparison with the numerous available radiometric, geothermometry and geobarometry data. Finally, an attempt was made to quantify cooling rates in the area and make precise correlations with the big dataset of laboratory blocking temperatures.

The quality of the magnetic signature was, in general, satisfactory and the obtained directions (mostly clockwise) could be interpreted in the regional kinematic frame. The information provided by the paleomagnetic and rock magnetic studies has been used in various ways to assess the history of the plutons: (1) Dominance of magnetite, hematite or maghemite with estimation of grain size entails information on cooling rates and mineralogical transformations. The medium to coarse-grain granodiorites and monzonites of Elatia and Vrondou yielded the less reliable results of this study. (2) Laboratory blocking temperatures range from 350-600°C. For a slow cooling of 3°C/Ma this gives a range of natural Tb of 150-400°C which could be compared to detailed radiometric data in Sithonia and Symvolo, enabling us to accurately date the magnetic components. (3) Demagnetization diagrams and stereographic projections suggest minor or no tilt for some of the plutons (Symvolo, Xanthi) and possible tilting during emplacement for Sithonia. (4) The anisotropy of magnetic susceptibility was studied to assess the possible deflections of the palaeomagnetic vectors; in most cases AMS was relatively low while in plutons with higher anisotropy no systematic correlation was observed between irregular directions and increased AMS. The potential field data, where available, gave additional constraints to the above results. For instance, the Xanthi pluton has proved to have a 6-7km lower depth and a shape of a truncated pyramid. Assuming world-wide standard batholith burial depths versus critical isotherms we can estimate that the whole body has cooled ~above 13.5 km, which converges with the Curie isotherm for the area and crystallization depth calculated from geothermobarometry.

Acid Miocene volcanism in the Eastern Slovakia, variable sources and magma forming processes: constraints from petrology and geochemistry

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Young Middle Miocene (Badenian to Sarmatian) highly silicic volcanism is evolved in the region of the East Slovakia Depression (ESD). Four areal regions were sampled: 1) extrusions outcropping on the north of the ESD (Merník and Beňatina), 2) few bodies on the northern part of the ESD around Lesné, 3) small bodies on the south in the region of Zemplin and 4) bodies near southern continuation of the Slanské vrchy mts (Byšta). Variability in mineralogy reflects magma composition and stages of magma evolution. Highly siliceous rocks (70.7-77.3 wt. % SiO_2) occupy rhyolite field in TAS diagram. Rhyolite mineralogy is in part regionally dependent. The most striking feature is presence of almandine garnet ($Alm_{76}Pyr_{9.6}Gross_{6.9}Spess_{5.2}$) in extrusions at Merník, Beňatina and Lesné. Almandine phenocrysts with fairly homogeneous composition across the grain and with inclusions of zircon and apatite are presumed to be of magmatic origin. Presence of highly to moderately corroded garnet is suggestive of its instability at low pressure during ascent. High pressure garnet fractionation is recorded by intensive whole rock HREE depletion and steep REE profiles. Suppressed plagioclase fractionation indicated by absence of Eu negative anomaly and low Rb/Sr = 0.66 and corroded quartz phenocrysts is consistent with quick magma evacuation without essential low pressure fractionation/assimilation in the upper crustal magma chamber(s). Rhyolites from Byšta can be recognized by presence of orthopyroxene. Plagioclase, biotite, K-feldspar and ±quartz are surrounded by fully crystallized matrix (feldspars and quartz) with only minor glass abundance. Complex plagioclase zonality