of its displacement on the same surface, posing thus a severe danger for the area in general and specifically for the buildings that are built along its trace. The 2005-06 surface ruptures are interpreted as a combination of overpumping, compaction and fault creep. The contribution of each factor is not possible to be calculated, as there are too many uncertainties concerning the deformation model.

Kalamaria fault: This fault was exposed during the construction of a multi-stored residence building in Kalamaria, a town located next to Thessaloniki city. This fault is displacing marls and a paleosoil that is located on top of the sedimentary sequence. Morphologically it is manifested as a gentle scarp, observable in roads that cut through the fault along at least 500 m. Paleoseismological analysis showed that the fault has been inactive during Upper Pleistocene – Holocene as there are no indications for recent reactivations. However, the existence of the morphological scarp suggests that it has probably been active during that period, but microstratigraphical evidence for this activity has been destroyed by anthropogenic factors. Even if it is not active, the fault zone exists and it can act as a weakness zone during a distant earthquake or in response to water level fluctuations.

In conclusion, paleoseismological techniques can be of great effectiveness in the study of urban faults, either active or not. Planners should take into account this methodology, because it can greatly enhance the understanding of ground response in abnormal conditions.

A proposed methodology for coastal risk management

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Coastal erosion is a gradual process that alters the distribution of sediments and modifies the geomorphology of the coasts. It may result in the destruction of natural coastal defences (sand dunes, cliffs, etc) and the increase in land instability which may in turn result in flooding of the hinterland and landsliding of coastal areas with steep slopes and unstable materials. The damages induced by such hazards include loss of life, property, infrastructure, and land. The costs of emergency action, remediation and prevention can often represent a significant burden to the communities affected and to national governments. According to predictions, climate change impacts, including sea-level rise and extreme weather patterns, will lead to the increase in the frequency and intensity of such hazards. Risk-based decision-making is seen to provide the means of addressing the challenges put forward by climate change. The complexity and interrelation of the processes acting on coastal locations call for an integrated framework for the assessment of coastal risks and the identification of the appropriate measures for the prevention and reduction of erosion, flood, and landslide risks. In this paper, existing models for the mapping of pressures on coasts and current development practices and tools will be reviewed, before a holistic methodology is proposed in order to assist decision-makers in effective coastal risk management.

Paleocene-Eocene migmatites in the Bulgarian Rhodope revisited

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Migmatites of proved Paleocene-Eocene age are widespread in several tectonic units of the Rhodope metamorphic complex (RMC). Most of the migmatitic unit precursors consist of orthogneisses. These were predominately felsic rocks of granite to granodiorite and diorite composition of late-Paleozoic (Arda unit) and late-Jurassic protolith ages (Madan, Startsevo, and Chepinska unit). Zones of post-anatectic extension outline the unit boundaries obscuring the melt-in isograd in the RMC. The peak metamorphic conditions correspond to kyanite-

sillimanite transition at 650 - 700ºC / 0.6 – 0.8 GPa. The most common thermobarometric estimates are close to the water-saturated granite solidus in sillimanite stability field. The absence of clearly distinguished residuum and peritectic anhydrous minerals indicate fluid-assisted melting of metagranitoid precursors. Field observations distinguish metatexite and diatexite structural types. The metatexites occur in all migmatitic tectonic units. The diatexites occupy large domains in the Arda and Chepinska unit suggesting advanced melting within cores of regional thermal antiforms flanked by metatexite. The common constituents of metatexite sections are concordant to the foliation in situ leucosome ± melanosome, and mesosome. Discordant leucosomes fill decimetric scale shears and form vein-network together with concordant leucosomes, marking a transition to structurally disrupted diatexites. The latter include subautochtonous lens-like bodies and sheets of inhomogeneous granite. The mesoscale interconnected structures indicate syn-deformation melt flow. Different mechanisms of melt transfer resulted in injection of melt batches into metatexite and subsolidus sections of the RMC.

The rock-forming mineral assemblages comprise biotite, plagioclase, K-feldspar and quartz, plus amphibole in metagranodiorite and metadiorite mesosome, or muscovite in some diatexite (Arda unit). The leucosome is quartz-feldspar dominated and differs from mesosome and particularly from melanosome with lower mafic and accessory mineral proportions. Scarce amphibole-bearing leucosomes resulted from back-reactions between migrating felsic melts and refractory amphibole-bearing rocks. The normative mineral ratios span tonalite to granite field in mesosomes, and trondhemite to granite field in metatexite leucosomes, whereas granite bodies from diatexite domains correspond to low-temperature granite melts. The uniform accessory mineral assemblage includes: magnetite, zircon, allanite, apatite, ± titanite in metatexite; and magnetite, monazite, ± xenotime, ± garnet in diatexite. Inherited protolithic zircons dominate both metatexite and diatexite, while new Paleocene-Eocene zircon is scarce. The low temperature melts had little or no impact on dissolution and growth of zircon, however they were responsible for partial dissolution of allanite and apatite, and subsequent crystallization of Paleocene-Eocene monazite.

The geochemical features corroborate fluid-assisted low-temperature melting of felsic minerals and limited solubility of accessory phases in the melt. The felsic products of migmatization are depleted in Fe, Mg, Ca, HFSE (Zr, Hf, Nb, Ta, Th, and U), Y, and REE. The contents of Zr and LREE cluster close to felsic peraluminous melts saturation at 650 - 750ºC. The REE patterns display general depletion, strongly variable LREE/HREE ratios, and Eu/Eu* $\geq$ 1 in leucosome and anatectic granite bodies. The systematic compositional changes in the succession concordant leucosomes - discordant leucosomes - subautochtonous granite bodies reflect anatectic melt fractionation and emphasize the most incompatible LILE enrichment during anatectic melt migration and crystallization: increasing LILE/HFSE, K/Ba, and Rb/Sr, and decreasing Ba/Rb ratios; positive correlation between K/Rb and Eu/Eu* values of anatectic granite bodies. The elements ratios between the HFSE remain relatively unchanged overlapping mesosome ratios variation. For that reason the products of migmatization and precursors plot on the same fields of the discrimination diagrams and illustrate this way inheritance of geochemical features related to HFSE mainly.

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