lowest altitudes. Thus, the most negative δ^2H values of thermal waters observed far in the basin most probably result from recharge under cooler climatic conditions. Very high He excess contents and negative noble gas temperatures (NGT) derived from Ne and Ar concentrations are in agreement with such interpretation. The lack of ^{14}C and $\delta^{13}C$ values close to 0‰ in these wells also confirms that hypothesis.

Tracer data indicate the presence of the oldest waters in the north-eastern part of the basin whereas in the western part the exchange of water is faster by one to two orders of magnitude. That unexpected flow pattern most probably results both from the presence of some karstic channels in the western part, which enhance regional permeability, and from obstacles to horizontal flow caused by fault zones in the eastern part.

Crystallization conditions of the Xanthi Plutonic Complex (Rhodope Massif, Northern Greece): Geothermometry and geobarometry

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The Xanthi Plutonic Complex (XPC) is one of a series of Oligocene subduction-related plutonic bodies comprising an “acid” group and a “basic” group. Based on mineral compositions and assemblages of the “basic” group, the XPC is assumed to have originally crystallized at a pressure of 5.4 kbar and at a temperature of 1300^{o}C under relatively dry conditions and oxygen fugacity (fO_2) near the NNO buffer. As the basic magma migrates to shallower levels and at a temperature of about 870^{o}C, water content increases and oxygen fugacity moves towards the MH buffer. The increase of water content could be the result of open system evolutionary processes. The “acid” group crystallizes at an average temperature of 729^{o}C and at a pressure of 0.7 kbar under oxidizing conditions, between the NNO and MH buffer, suggesting a possibly different origin and/or evolution for the “acid” group.

The assessments of favorable UV conditions for human health over northern Eurasia

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UV radiation can have both positive and negative influence on human health. According to the classification of biological UV resources proposed by Chubarova (2007) we define favourable UV conditions as the conditions, when it is possible to get vitamin D3 at noon within an hour but when at the same time the UV index does not reach the high UV category. Different methods were used to estimate the thresholds for generating the vitamin D3 in the skin. One method was based on the approach, which has been proposed by Holick and Jenkins (2003), and another one was based on the recommendations given in the CIE 2006 publication. We compared both approaches by evaluating and comparing the year periods with the conditions favourable for vitamin D3 production. The periods were obtained through the calculation of biologically active irradiance using the TUV model with the 8 stream DISORT solver, and some other modifications described in Chubarova (2006). According to our estimates in midlatitudes the application of the second method leads to the increase in day number (approximately 18 days), when it is possible to get the vitamin D3 in clear sky conditions. It is necessary to emphasize that this difference takes place mainly due to the different thresholds of the skin exposure area recommended in these approaches, since both erythemally-weighted and vitamin D3 irradiance have similar absolute values at noon in spring and autumn, when a “jump” from unfavourable to favourable conditions and back for vitamin D3 production occurs. We have also revealed a large difference in sensitivity of erythemally-weighted and vitamin D3 irradiance to the changes in solar zenith angle, total ozone content (especially, at high solar zenith angles), and quite similar aerosol influence on both types of biologically-active irradiance. Using the updated criteria for vitamin D3 threshold from CIE 2006 we estimated the biologically active UV irradiance over northern Eurasia. The spatial and seasonal distribution of UV favourable conditions has been analyzed both for the clear sky and for the cloudy atmosphere. The calculations were based on the TOMS/OMI total ozone and effective UV reflectivity datasets. The latter one has been used for estimating the effective transmittance in cloudy conditions. The aerosol parameters necessary for computations were taken from a specially developed aerosol climatology, which has been obtained on the base of ground-based AERONET dataset, radiometric Russian datasets and satellite MODIS retrievals (collection 5) over northern Eurasia. A special attention was paid to estimating the uncertainties of MODIS AOT dataset. We found the large AOT biases in spring conditions over Siberian area. The specific features of the defined favourable UV conditions for different time periods are discussed for the various types of human skin in the clear and cloudy atmosphere.

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Role of the olistostromes and olistoliths in tectonostratigraphic evolution of the Outer West Carpathians

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The oldest olistostromes in the Outer West Carpathians are related to the Late Jurassic-Early Cretaceous rifting and post-rifting stage in which the Outer Carpathian deep sea sedimentary basins were opening. Then forming the proto-Silesian Basin later was split into separate tectonic units – Silesian and Subsilesian nappes. In the Silesian Nappe the oldest deposits are represented by the Vendryně Formation (Late Jurassic) that consists in many places of clasts and olistolithes of shales and marls. The Hradište Formation (Early Cretaceous) often bears debris-flow deposits rich of exotic-rock pebbles, but also olistostromes with olistoliths or olistoplaques of the Cieszyn and Vendryně formations.

In the Late Cretaceous – Paleocene took place a contraction. It was a formation time of subduction zones along the active margins and development of deep-marine flysch basins. The Magura, Dukla, Silesian and Skole basins have been formed then. Ridges separated them supplying the basins with huge amounts of coarse-clastic material marked by numerous debris-flow sediments and occasionally olistostromes and levels with huge olistoliths. They occur in the Upper Cretaceous, Paleocene and Eocene strata of the Silesian, Subsilesian and Skole nappes. Specially known are large olistholits of the Węgierka from the Upper Cretaceous deposits of the Skole Nappe Marls and the Frydek Marls with huge blocks of andesites and pebbles of other exotic rocks from the Subsilesian. In the Silesian Nappe the debris-flow with flysch olistolites and exotics are frequent within the Godula and Istebna Beds (Late Cretaceous –Paleocene), the Ciężkowice Sandstones (Early – Middle Eocene) and occasionally within the Hieroglyphic Beds (Middle – Late Eocene). The Middle Eocene olistostromes are known also from the Bystrica and Rača subunits of the Magura Nappe.

A collision of the European Platform with the Inner Carpathian terrain took place in the Oligocene and Early Miocene stage causing a development of the Outer Carpathian accretionary prisms. Evolving prism supported olistolithes and olistostromes to the basins until their structural closure. Especially in the inner part of the Silesian Nappe the Krosno Beds (Oligocene – Early Miocene) are rich of olistoliths and in some places olistostomes with large olistoplaques occur. Olistostroms at the top of the section of the Krosno Beds has finished sedimentation in the Silesian Beds. In the western part of the Subsilesian Nappe section of the Krosno Beds is ended with olistostrome rich of huge olistoliths of the Jurassic,