ture units to younger ones. On the slope of ancient pre-Cambrian Platform the heat flow values are relatively low (35—45 mW/m^2). In the Paleozoic Scythian Plate heat flow increases to 50—65 mW/m^2. A number of geothermal anomaleous zones are distinguished here. High heat flows of some 70—80 mW/m^2 are found in the Karkinit riftogenic trough, Cenozoic Indol-Kuban depression.

The thermal state of the lithosphere depends on two main factors: thermal energy balance and heat transfer conditions. The energy balance is formed by intralitospheric energy sources, mainly radiogenic, and by the amount of heat which is supplied from below (through its basement). Heat transport within the lithosphere is predominantly by conduction. However, in active regions, effective thermal conductivity varies in time. As a result, transient heat flow anomalies are produced, which are complicated by thermal disturbances due to magmatic activity, sedimentation, erosion and horizontal displacement of the lithosphere plates. In constructing a well-grounded thermal model for the lithosphere, the dynamics of the all these processes should be considered. This requires the use of modelling based on complicated physical, mathematical, geophysical and geological phenomena and methods.

In the general case, temperature and heat flow distribution in the inhomogeneous lithosphere dominated by conductive heat transfer satisfies the transient heat conduction equation. The problem may be simplified by its subdivision into two ones: stationary and transient. The stationary problem describes the thermal field of the inhomogeneous lithosphere with thermal conductivity produced by radiogenic heat sources and the mantle heat flow. The transient problem describes temperature and heat flow variations due to short-time changes of temperature, heat generation or heat exchange conditions. The stationary field is taken to be a background (normal field) for the separation of transient anomalies. This problem was solved by finite differences methods.

Transient geothermal anomalies in the studied areas are associated with sedimentation, climate changes, lithosphere extension and astenosphere uplift. The accuracy of the thermal history calculations was checked using the following criteria: thickness and depths of specific lithofocies and basement surface on the present cross-section, thickness of the earth's crust the present values of heat flow and temperatures in the sedimentary rocks.

The modelling results are presented in the form of cross-sections of the lithosphere of temperature and heat flow distribution for two profiles crossing the Western and Eastern Basin of the Black Sea depression. Based on the results of the modeling of the mantle and the earth's crust heat flow components have been determined. Contribution of the sedimentary layer in the central part of the Black Sea Basin is 10—12 mW/m^2, contribution of the whole crust is 13—16 mW/m^2. The contribution of the mantle is 45±4 mW/m^2. It decreases to 30±5 mW/m$_2$ on the Scythian Plate and to 20±3 mW/m$_2$ on the pre-Cambrian Platform. The surface heat flow decrease in Black Sea Basin is mainly due to intensive accumulation of Pliocene-Quaternary sediments. The high mantle component is due to young tectonic activity. Our thermal modelling covers the depth range of the relatively cold thermal layer with temperature below 1300 °C. The 1300 °C temperature level is found at depth between 75—90 km in the central part of the Black Sea Basin, 100—130 km in the Scythian Plate and 160—180 km in the southern slope of the pre-Cambrian Platform area.

Reflection of tectonic structures of platform cover of the North of Russian plate in atmospheric field, character of geomagnetic variations and deep's decontamination

© ***Y. Kutinov, Z. Chistova, 2010***

Institute of Ecological Problems of the North, Ural branch, RAS, Arkhangelsk, Russia
kutinov@iepn.ru

In 2001—2009 we measurements of atmospheric pressure above fault-crossing were carried out, and the fact of constant "deficiency" of atmospheric pressure was established. These minima have received the working name — "static" and have difficult structure with increase of values in the centre

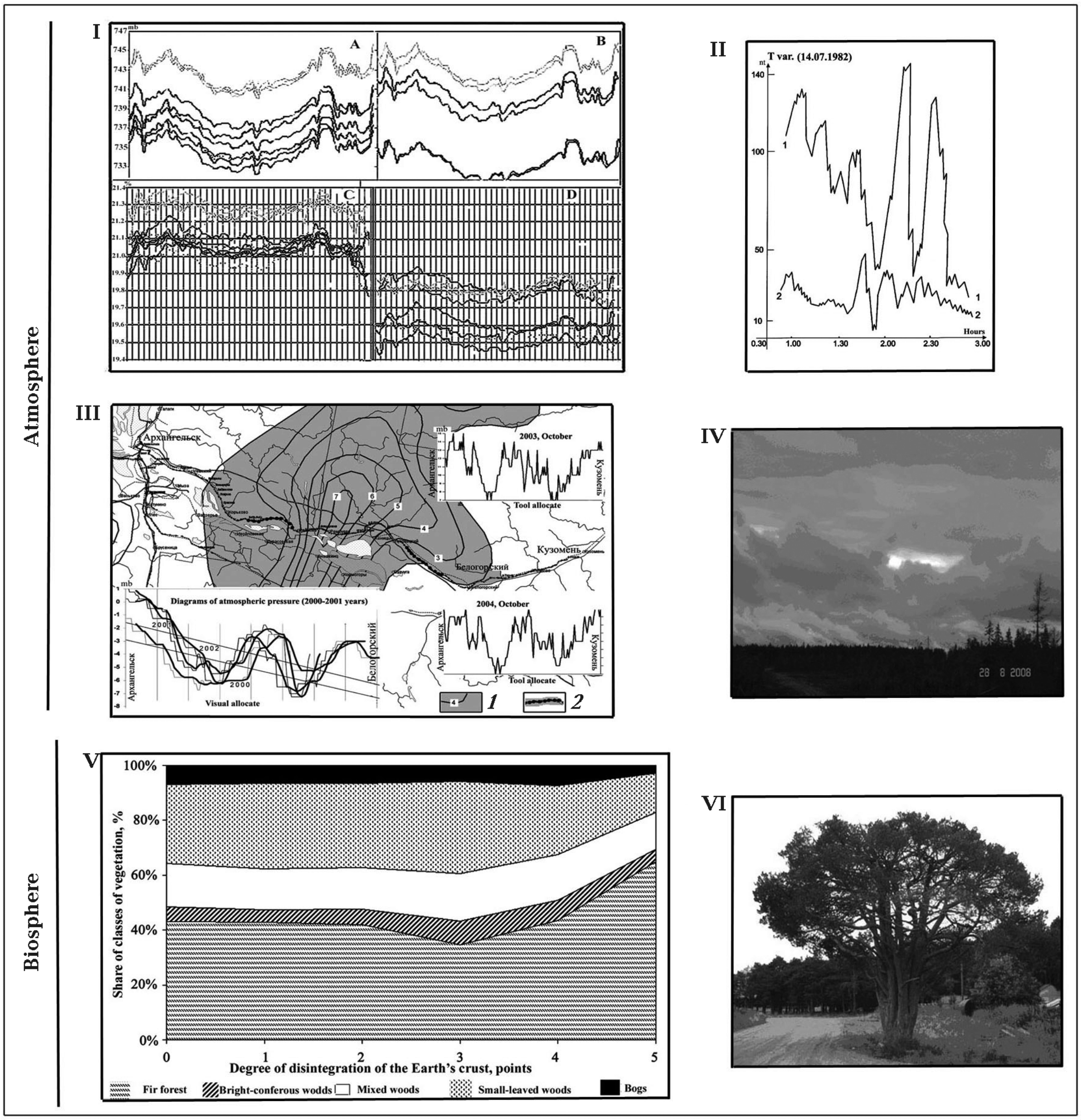

Fig. 1. Model of Geospheres interactions on the area of fault-crossing (atmosphere, biosphere): I — diagrams of atmospheric pressure (A, B) and contents of oxygen (C, D); II — diagrams of magnetic variations in fault-crossing and behind its limits; III — structure of atmospheric minimum (*1* — isolines of density of faults; *2* — anomalies of "deficiency" of atmospheric pressure); IV — structure of overcast; V — structure of vegetative cover; VI — dichotomy of trees.

and downturn on periphery (Fig. 1, III) the numerous measurements which have been carried out in different years and the seasonal periods, have shown that the allocated minima are static and do not undergo seasonal changes.

The revealed fact of change of dynamics shot wave geomagnetic variations at the moment of magnetic storms in fault-crossing [Kutinov, Chistova, 2004] (Fig. 1, II) and presence of zones of the increased conductivity (Fig. 2, II, III) allows to assume occurrence in tectonic structures induced magnetic-telluric currents and, as consequence, ionization of air above tectonic structure and units of faults. The original structure of overcast above fault-crossing speaks about change of electric conductivity of atmospheric air (Fig. 1, IV). And constantly observably pinkish shade can be interpreted as display of effect Cherincov' luminescence arising due to compression of rocks.

In space pictures of cyclones in northern hemisphere results of nuclear interaction of neutrons and

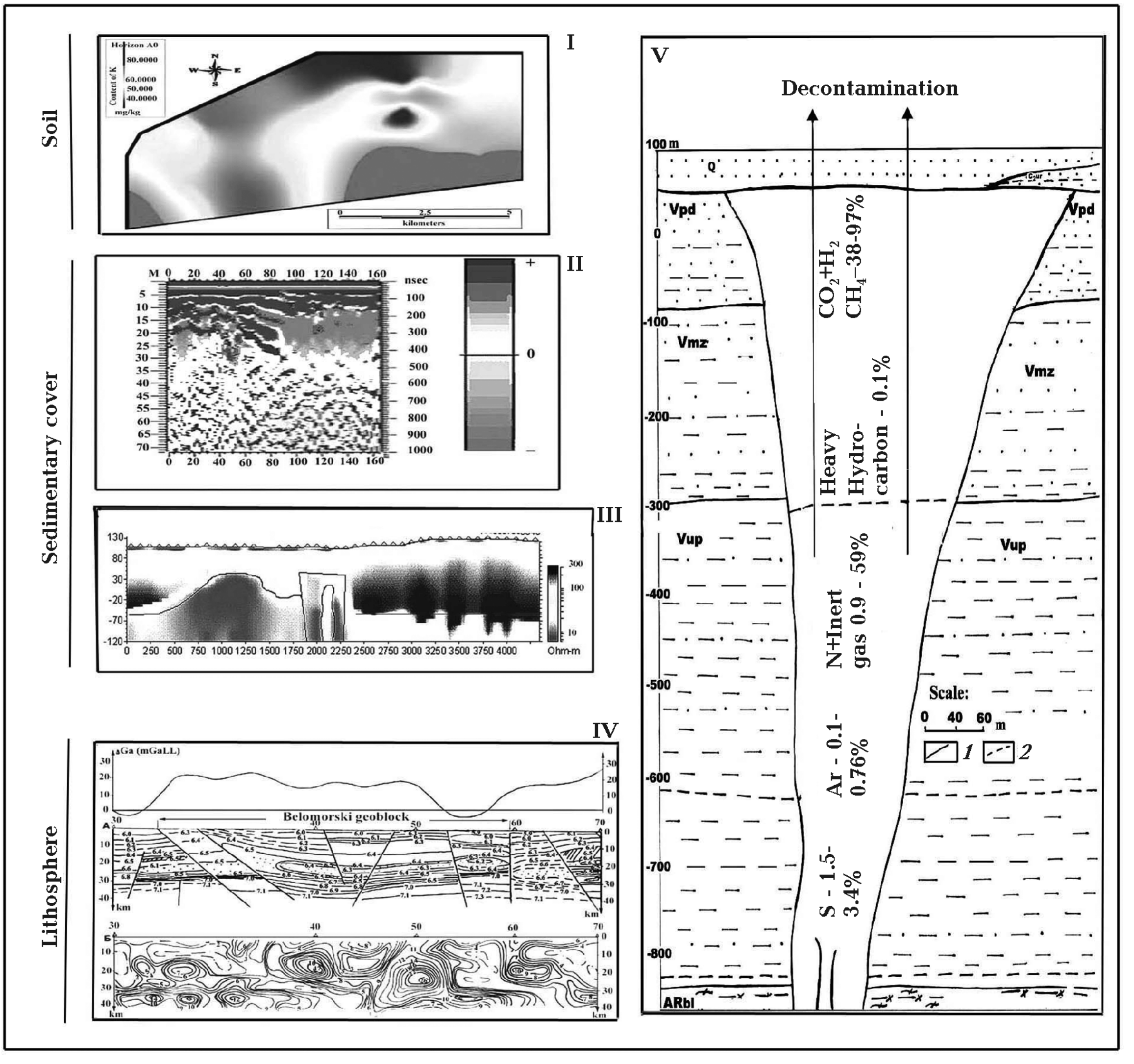

Fig. 2. Model of Geospheres interactions on the area of fault-crossing (geological medium): I — contents K in horizon A0; II — results of georadar-tracking researches; III — geoelectric section; IV — section on data DSZ; V — section of fault-crossing (geological boundary: *1* — established, *2* — assumed).

high-energy protons with an ozone cloud of a planet as the separate petals twirled counter-clockwise [Akhundov et al., 2007] are clearly visible. Getting in a nucleus of ozone, neutrons and high-energy protons translate it in the excited condition which is shown all over again as a silvery cloud, then in due course the cloud grows fat and, at last, becomes dark, having formed water. Water, in turn, drops out on a surface of the Earth as deposits — a rain, snow or hailstones. I. e., formation of a luminescence, difficult structure of overcast, other character of loss of deposits is possible. By us it is established, that in conditions of the European North frequency of loss of deposits and their quantity in the centre and on periphery of fault-crossing of tectonic dispositions which territorially coincide with stationary minima of atmospheric pressure for July—August essentially differ. Deposits in the centre of tectonic units dropped out much less often, and their quantity on 26-is less than 38 %.

In 2008 and 2009 by us were carried out on profile Arkhangelsk — Pinega for specification of dynamics of change of the contents of oxygen in near-ground layer of atmosphere on the area of fault-crossing. Received in 2008 and 2009 results speak, that, despite of practically full convergence of diagrams of atmospheric pressure, the picture of the contents of oxygen in 2009 differs from similar in 2008 (Fig. 1, I). The contents of oxygen depends from *PT*-conditions and inflow of deep" gases. Values of atmospheric pressure during gauging were practically identical a temperature mode is characterized about zero values and has no significant distinctions. Thus, there is only an increase inflow deep' gases, first of all CO_2.

Our data testify to presence of influence of tectonic infringements on Environment due to occurrence induced currents, deep decontamination and change of structure atmospheric fields. The counter system "influence — response" is observed, i. e. not only change of a geomagnetic field and atmospheric pressure influence on is intense — deformed a condition of the geological Environment, but also the Environment influences sun-meteorological parameters. I. e., in area of tectonic units vertical through channels difficult geospheres interactions, fascinating lithosphere, hydrosphere, biosphere and an atmosphere are formed. The model of lithosphere, hydrosphere, atmosphere and biosphere interactions in areas of fault-crossing is developed (Fig. 1, 2).

Researches is executed at financial support RFBR, the grant 08-05-99816 "Active processes in the environment, their monitoring and forecasting in the territory of Arkhangelsk region" and Programs DSE of the Russian Academy of Science N 9 " Geospheres interactions", Project " "Studies process of interaction geospheres in active geological structure in the North of Russian Plate".

References

Akhundov I. D., Guseinov M. A., Solodilov L. M. Magnetic storms, variations geomagnetic and magnitotelluric fields at electromagnetic radiation from focus of earthquake // Razvedka i okhrana nedr. — 2007. — № 2. — P. 34—38 (in Russian).

Kutinov Y. G., Chistova Z. B. A hierarchial number of displays alcaline-ultrabasic magmatism of Arkhangelsk adamantine province. Their reflection in geological and geophysical data. — Arkhangelsk: OAO "IPP "Pravda Severa", 2004. — 283 p. (in Russian).

Geodetic estimations of the modern motions on Tien Shan

© ***S. Kuzikov, 2010***

Scientific Station, RAS, Bishkek, Kyrgyzstan
ksi@gdirc.ru

We can obtain information about formation and a posterior transformation of crust, in particular, from geological and structurally-tectonic researches or maps. More often we have only final result of change of geological objects and we do not know how this result has been reached in the course of time. Absence of such data has led to occurrence of extreme opinions about mode of intra-continental deformation of lithosphere. According to one of them, the prevailing part of movements realize through sliding of blocks on faults [e. g., Peltzer, Saucier, 1996; Replumaz, Tapponnier, 2003]. The alternative notion is based on the prevalence of plastic deformations and properties of a nonlinear-viscous liquid in crust [e. g., Flesch et al., 2001]. Long time the Research station of RAS (RS RAS) realizes geodetic researches of different scale, which allow to estimate quantitatively modern near-surface movements of Tien Shan crust and partially to understand the geodynamic problem designated above.

In Central Asia the regional GPS researches are in progress from 1992, by present time ~550 sites of periodic measurement are dispersed on ~1.7 million km^2 in territory of Kyrgyzstan, Kazakhstan, Uzbekistan, Tajikistan and China. The kinematic-statistical analysis of horizontal velocities measured for last 10—15 years, testifies about presence here quasi-rigid areas of crust (domains) in the size from ~30×50 to ~600×800 km^2 in which modern velocity of deformation is negligibly small [Kuzikov, Mukhamediev, 2010]. The inter-domain space (IDS) separate the quasi-rigid domains (QRD). IDS has width from first km to several hundreds km, in which velocity of displacement (to ~10 mm/year) can considerably exceed deviations from rigid whole in QRD (on the average — 0.35 mm/year). Total area of QRD