

GLOBAL GEODEFORMATION PROCESSES IN THE EARTH CRUST FLUIDTRANSMISSION DYNAMICS

Rudakov V.P. (IPE RAS)

rudakov@mail.ru; fax: (499) 252-21-98; tel.: 254-90-06

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Investigations of the geodeformation processes reflected in variations of the fluiddynamic (first of all, emanation) fields of fault geosstructural formations of the earth's crust geosynclinal (seismoactive) and platform regions of the former USSR, have allowed to reveal some regularities of time-space distribution of the geodynamic events determined by processes of self-organizing lithosphere, accompanying changes of the rotational regimes of the Planet [1,2]. By results of the display dynamics regularities analysis in scales of globe the map - scheme (fig.1) of global distribution of the lithosphere geodeformation pulsation centers (GDPC), representing areas of "interference" (extremums superposition) of latitude and longitudinal components of the geodeformation waves of a seasonal (year) periodicity was made. And, at realization of graphic constructions the empirically received data on speed of the seasonal geodeformation wave fronts migration in latitude (7 km/day) and longitudinal (28 km/day) directions where used with binding the moments of the wave extremums passage to concrete coordinates, i.e. to on what monitoring geodeformation processes was carried out.

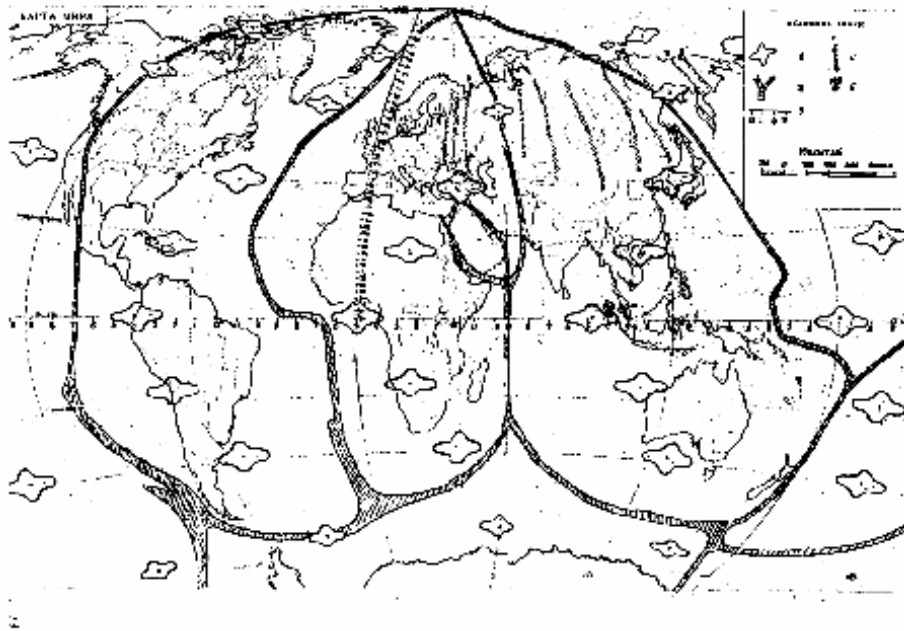


Fig.1. Scheme of global displacement of the geodeformation pulsation centers of the earth's crust (1). On the scheme are shown the basic trunks of the rift systems of the planet (2), the basic zones of meridional fault systems (4) of the former USSR territories (according to work [8]) and time scales of migration of fronts of a seasonal geodeformation wave in latitudinal and in meridional directions (3). Numbering of the meridional lineaments corresponds to given in work [8]. The mark (5) corresponds to a position of the catastrophic earthquakes on the Sumatra island

Distinctive feature of a seasonal geodeformation wave is susceptibility of its amplitude (at average values about 0.3×10^{-6} [3]) to modulating influence of the more long periods geodeformation waves therefore its amplitude can reach critical levels (about 10^{-4}). Excess of these values is accompanied, as a rule, by emission (in the appropriate regions) seismic or volcanic energy and by the other geodynamic phenomena [4-6].

At the same time, the seasonal geodeformation wave, influencing on amplitude-phase parameters of wave geodeformation processes of the intrayear periodicity, determines dynamics of the more high-frequency spectrum area of the geodeformation "vibroinfluence" on fluid systems of underground hydro-

sphere. It allows to consider represented on scheme GDPC as local sources of rhythmic geodeformation influence on layer fluids (from components of a spectrum of intrayear fluctuations up to components of intraday periodicity), promoting their directed carry ("pumping") in the fault structures in latitude and longitudinal directions.

As follows from the received scheme, GGPC are located (in the majority) above geodynamically active spots of the Planet, being imposed on the common configuration of the basic continental and intercontinental paleorifts, continental paleo-outlying districts and regional deflections of the earth's crust. Moreover, they (centers) coincide, or are near to many known provinces of hydrocarbon accumulations both in territory of Russia, and behind its limits. The last allows assume, that in formation of sedimentary cover oilgasgenessity and in the regularities of oil and gas accumulations distribution in the earth's crust the geodeformation factor determined by rhythmic influence on lithosphere of the geodeformation pulsation centers, has no smaller value, than factors of geology-geochemical genesis. It is obvious also, that due to the geodeformation factor influencing on change of the fluidtransmission regimes in the earth's crust, the conditions favorable to development of appropriate geology-geochemical conditions and a thermal regimen of the hydrocarbons deposits formation are created. Therefore, the data received by us, not contradicting, on the one hand, to the model constructions basing on the preconditions of the organic origin oilgasgenetic accumulations, bring, at the same time, the significant contribution to development of the models describing processes of inorganic hydrocarbons formation. And, as to us it is represented, the reology of those and other models it is in the best way shown in conditions of the oilgasbearing basins [7] where geology-geochemical factors and geodynamic conditions to the greatest degree correspond to a set of the parameters pawned in the description of models of both directions, i.e. in model of the supporters of an organic and inorganic origin of the hydrocarbon accumulations.

The analysis of the received scheme of existential accommodation on a world map of the geodeformation pulsation centers of the earth's crust in preconditions of the establishment of relation with them of the hydrocarbon accumulations provinces, testifies not only about proximity those and others to the geodynamically active formations of the earth's crust, but also to direct participation of the lithosphere GDPC in the hydrocarbons accumulations formation. This participation is determined, first of all, by formation of superfluous pressures in the fluidsaturated layers promoting directed carry ("pumping") in them oil-gas components by the systems of meridional faults in northern direction for northern hemisphere and in southern - for southern. Last circumstance creates preconditions for formation of enormous hydrocarbons accumulations in the rift near polar systems. Assumptions, probably, also are fair and for the faults of latitudinal direction, however in this lineaments system of the earth's crust migration of fluids is carried out exclusively in the western direction according to a direction of the seasonal geodeformation wave latitudinal components fronts moving.

All this creates preconditions for the strategy of planning the prospecting researches, based on tracing of known and prospective zones of up rift geostructural formations, superimposed in space with a position of the geodeformation pulsation centers of the earth's crust, and search within the limits of zones of their dynamic influence of the structural "traps" providing long-time (to geological measures) safety of hydrocarbon accumulations.

On the other hand, the possibility to restore on the basis of the retrospective analysis the planet velocity regimes in various epoch of its geological history, allows to recreate system of the up rift paleostructural formations, favorable for the oilgasbearing accumulations. So, for the modern Earth rotational regimen determining position of the continental rift controlling structures and displacement of the geodeformation pulsation centers of an earth's crust, in territory of Russia perspective from not et investigated areas of are the areas of the foothill deflection of the Verkhoyansk hills and East Siberian sea shelf are represented. And, the scales of the oilgasgenessity in these territories are probably comparable to scales of the oilgasgenessity of West-Siberian oilgasgenessity province and of Kara sea shelf that will quite be coordinated with prognosis estimations of the geologists - oilmen classifying mentioned territories as potentially oilgasbearing basins [7].

The stated assumption finds confirmation not only that allocated "units" of the earth crust geodeformation pulsation coincide with the centers of modern geodynamic activity of the Earth, repeat in the general configuration contours of the basic meridional trunks of the planet rift systems [8] and are imposed on the areas of existing oilgasgenetic provinces, but also that formation of hydrocarbon accumulations in places

of active tectonic destruction of the earth's crust provokes the most catastrophic seismic events. From the most known examples in the last century are Gasly earthquakes of 1984 and Neftegorsk earthquake of 1995, and from occurred more recently earthquakes near to island Sumatra December, 26, 2004 and March, 28, 2005, reached on the level of seismic energy emission practically nine-ball mark on the Richter scale are classical.

As follows from figure, earthquakes were realized within the limits of the geodeformation pulsation center allocated with us which not only is in a zone of active development of the subduction processes which have generated morphology of the hills of island Sumatra and its vicinities, but also "marks" its (hills) oilgasgenesity [9]. And, for formation of the huge hydrocarbons accumulations on the Sumatra island and in its vicinities initially there were both geostructural, and geology-geochemical, and geodynamic preconditions, characteristic for the oilgasgenetic basins. That is, in limits of "Sumatra centre" of the earth crust geodeformation pulsation the both models – model of organic and model of inorganic genesis of hydrocarbons are functionally sold.

Thus, the analysis results of the wave geodeformation processes dynamics investigations made in the geosynclinal and platform regions with the purpose of an establishment of their participation in formation of the catastrophic geodynamic phenomena has allowed to draw a picture of global distribution of points of the earth crust geodeformation pulsation, formed by processes of rhythmic change of the Earth velocity rotation. Participation of these points in formation of the earth degassing rhythms, formation of the earth crust structural - tectonic elements and formation of the hydrocarbon accumulations is also the confirmation that in a basis of a nature of catastrophic seismic events lays the interrelation of areas of formation of hydrocarbon accumulations with zones of modern geodynamic activity.

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