

# WAVE UNIVERSE, PHYSICAL NATURE OF THE MICROWAVE BACKGROUND AND POLYPHONY OF THE UNIVERSE.

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## ABSTRACT.

The problem of existence in the Universe, besides widely known microwave background, also found out In observations of a set of others (IR, UE, X-ray, gamma) diffuse radiations, is discussed.

It is shown, that the problem may be correct interpreted within the framework of the Wave Universe concept asserting and forecasting existence in it Hierarchy of diffuse backgrounds Radiations - Polyphony of the Universe.

The Backgrounds Hierarchy is directly connected to presence of Hierarchy of phase velocities of propagations of perturbations – sound velocities - in multicomponent space plasma, with megawave Shells structure of astronomical systems.

The observable microwave background, generally speaking, is not any preferable, distinguished in physical or conceptual sense, and is only one of components of Backgrounds Hierarchy - Polyphony of the Universe, corresponds to background  $F^{[3]}$ , (phase) velocity of propagation of perturbations - sound velocity with  $C_*^{[3]} = 11.483 \text{ km}\cdot\text{s}^{-1}$ ; it is characterized by temperature  $T_*^{[3]} = 2.9 \text{ K}$  and the length of a wave  $\lambda_*^{[3]} = 1 \text{ mm}$  of the maximal intensity of background radiation.

## THE WAVE UNIVERSE, HIERARCHY OF SHELLS AND SOUND VELOCITIES OF SPACE PLASMA.

Observable physical and dynamic structure of any astronomical systems - from planetary systems up to superclusters of galaxies - it is closely connected with their wave (*megawave*) and *Shells* structure. That is one of basic statements of the Wave Universe concept [1,2,3].

Hierarchy of  $G^{[s]}$  Shells each of astronomical systems corresponds to Hierarchy of phase velocities of propagation of small perturbations (megawaves) - sound velocities

$$C_*^{[s]} = (1/\chi^{s-1})C_*^{[1]}, \quad s = \dots, -2, -1, 0, +1, +2, \dots,$$

where  $C_*^{[1]} = 154.3864 \text{ km}\cdot\text{s}^{-1}$  - is the calculated value of *sound velocity* of wave dynamic system (WDS),

$\chi = 3.66(6)$  - Fundamental parameter of Hierarchy (Chechelnitsky Number) [2].

Sound velocities  $C_*^{[s]}$  characterize dominant physical properties of medium (interplanetary, interstellar plasma) in appropriate  $G^{[s]}$  Shells.

Presence of velocity  $C_*^{[s]}$  Hierarchy of propagation of small perturbations (sound velocities) may be naturally It is connected to a physical structure of (interstellar, interplanetary) medium and, thus, may be understood in frameworks of representations about it, as about multicomponent plasma, characterized by quite giving in measurements set of physical parameters.

Whereas to movements of space plasma (for example, Interplanetary plasma - in a solar wind), having velocities  $v$  (in particular,  $v = v_{T,e} [\text{km}\cdot\text{s}^{-1}]$  - thermal velocities of electrons), there correspond electronic temperatures [4]

$$T = T_e = (1/3 k)m_e v^2, \quad T = (v/6.743)^2 [\text{K}^\circ], \quad v[\text{km}\cdot\text{s}^{-1}], \\ v = C_*^{[s]},$$

( $m_e$  – mass of electron,  $k$  - Boltzmann constant), Hierarchy of sound velocity  $v=C_*^{[s]}$  it is closely connected to Hierarchy of electronic temperatures

$$T_*^{[s]} = (m_e/3k)(C_*^{[s]})^2 = (m_e/3k)(C_*^{[1]})^2/\chi^{2(s-1)} = T_*^{[1]}/\chi^{2(s-1)}$$

$$T_*^{[1]} = (m_e/3k)(C_*^{[1]})^2$$

Temperatures may be represented and in power Units [ev] by virtue of parity  $T[\text{ev}] = T[^\circ\text{K}]/11604.5$ , where it is taken into account, that Energy 1 ev corresponds to 11604.5 K [5].

### Physically Distinguished Levels of Temperatures.

Within the framework of the Wave Universe concept it is represented to the natural also existence and sets physically preferable levels of temperatures

$$T_N^{[s]} = (m_e/3k)(v_N^{[s]})^2 = (m_e/3k)(C_*^{[s]})^2(2\pi/N^2) = T_*^{[s]}(2\pi/N^2),$$

$$T_*^{[1]} = (m_e/3k)(C_*^{[1]})^2$$

adequately answering to set physically distinguished elite [2] velocities in each of  $G^{[s]}$  Shells of astronomical systems

$$v_N^{[s]} = C_*^{[s]}(2\pi)^{1/2}/N, \quad s=\dots,-2,-1,0,1,2,\dots$$

$$C_*^{[s]} = (1/\chi^{s-1}) \cdot C_*^{[1]},$$

where  $N$  – Main quantum numbers of elite status (orbits) – *close to Integer, Semi-Integer*.

Among them detection in observations of bright from these levels is most probable. Its adequate (answering) to strongest - dominant (from sets of elite) velocities  $v^{[s]}$ , which on the initial level of recursion (in Shells  $G^{[1]}$ ,  $G^{[2]}$  at  $s=1, 2$ ) correlate with velocities  $v_{N_{\text{Dom}}}^{[1]}$ ,  $v_{N_{\text{Dom}}}^{[2]}$  of planetary orbits accordingly I (Terrestrial) and II (Jupiter) groups ( $N_{\text{Dom}}$  - quantum numbers of planetary orbits, relatives to

$$N_{\text{Dom}}=9; 11; 13; (15.5 \ 16; 19.5; (21.5) \ 22$$

as it follows from the observed data of the Solar system) [2,3]. Such preferable dominant states in  $G^{[s]}$  Shells of astronomical systems may be detected, in particular, as the radiations connected to surpluses on appropriate dominant temperatures  $T_{N_{\text{Dom}}}$  and wavelength  $\lambda_{N_{\text{Dom}}}^{[s]}$

$$\lambda_N^{[s]} = b/T_N^{[s]} = b/T_*^{[s]}(2\pi/N^2), \quad \lambda_*^{[s]} = b/T_*^{[s]},$$

( $b = 2.89779 \cdot 10^{-3}$  [m·K] - constant of the Wien law) at  $N = N_{\text{Dom}}$ .

### Universality (Invariancy) of Elite Velocities and Temperatures.

Universality (invariancy) of physically preferable – elite velocities (including - and  $C_*^{[s]}$  sound velocities) and appropriate Temperatures in  $G^{[s]}$  Shells of various astronomical systems may be established and proved, first of all, for the nearest, experimentally investigated objects – Solar (planetary) system and physically independent astronomical systems (with distinguished masses of the central bodies) - satellite systems of planets [2, 3].

Hardly it is necessary to doubt of that, as far planetary systems (first of all, with mass of the central star equal to Sun) have similar dynamic, wave and Shell structure, are characterized similar – universal (invariant) by a set of physical preferable – elite - velocities and temperatures.

#### Proposition.

Universality (invariancy) of physically distinguished - elite velocities in astronomical systems induces universality (invariancy) of unequivocal the physical values connected to them, including, coordinated elite temperatures  $T_N^{[s]}$ , lengths of waves  $\lambda_N^{[s]}$  (of maximal intensity of radiation).

Distribution of such representation and on astronomical systems of more high ranks (on galaxies, clusters, superclusters of galaxies) represents the extrapolation, verified not so much by some general(common) physical reasons ( absence of impenetrable "walls", barriers for extremely mobile space plasma etc.), how by many the argument, based on use of quite concrete results of uniform, connected and not having of fitting parameters models. Certainly, as deciding (solving) reason may serve

only a conformity of consequences of modelling representations to results of observation in extrapolated areas.

### Hierarchy of Physical Mediums (Continuums), Adequate to $G^{[s]}$ Shells.

The resulted Table contains the data about physical parameters, characterized Hierarchy of  $G^{[s]}$  Shells of astronomical systems. Besides the data on  $C_*^{[s]}$  sound velocities and corresponding electronic temperatures  $T_*^{[s]}$  (in usual [K] and power [ev] units), in the Table the data are given and about lengths of waves  $\lambda_* = \lambda_*^{[s]}$ , adequate to the maximal intensity of radiation (in model of absolutely black body), counted up in corresponding with the Wien law

$$\begin{aligned}\lambda_* &= b/T_*, \quad b=2.89779 \cdot 10^{-3} [\text{m} \cdot \text{K}^\circ], \\ v_* &= c/\lambda_*, \quad (c - \text{light velocity}), \\ T_* [\text{ev}] &= T_* [\text{K}^\circ]/11604.5\end{aligned}$$

In the Table the data may involve the special attention, answering to  $G^{[s]}$  Shells of astronomical systems of the Universe. But, before everything, - some known from observations minimal information.

### The Microwave background. Observation.

Let's afford the brief reference (Shama, 1973) [6]: " However we should ascertain, that (microwave) *background radiation for the first time it was registered casually*. Why so happen? Probably, there are some reasons... The initial theory of the Hot Universe which predicted modern value of blackbody temperature about(near) 25 K, it was formulated in 1948..."

According to modern representations (Longair, 1984) [7]: "Radiation with Planck's spectrum, prevailing in the range from 400 GHz, is and is well-known *microwave background radiation*. Its basic properties are those: radiation practically isotropical on all heavenly sphere, the top limit on anisotropy In all angular scales  $\Delta J/J \leq 10^{-3}$ : on its share it is necessary a largest part of energy of background electromagnetic radiation,  $\varepsilon \cong 0.25 \text{ ev/cm}^3$ ; its spectrum is very close to Planck's with temperature  $T = 2.9 \text{ K}$ ".

According to the measurements which have been carried out in May 1983.

In Lick Observatory (Meyer, Jura 1984) [8], brightness temperature of microwave background on length of a wave of  $\lambda = 1.32 \text{ mm}$  it is equal  $T = 2.8 \pm 0.3 \text{ K}$ . Measurements (De Amici et al, 1984) [9] on  $\lambda = 9.1 \text{ mm}$  give  $T = 2.87 \pm 0.21 \text{ K}$ . In research (Friedman et al, 1984) [10] it is marked, that the found value of temperature of microwave background  $T = 2.91 \pm 0.19 \text{ K}$  it will well be coordinated to the data of other authors on close lengths of waves (to  $\lambda \cong 3 \text{ cm}$ ). Measurements of spin temperatures on length of a wave  $\lambda = 2.64 \text{ mm}$  for interstellar cyan CN (Field et al, 1966) [ 11 ], (Peimbert, 1968) [12] give average temperature of microwave background  $T = 2.89 \pm 0.14 \text{ K}$ , that will be coordinated to measurements of (Bortolot et al, 1969) [ 13 ]  $T = 2.83 \pm 0.15 \text{ K}$ .

According to measurements of Woody and Richards outside of terrestrial atmosphere, density of distribution of energy of microwave radiation well there corresponds to curve of radiation of absolutely black body with temperature  $T = 2.96 \text{ K}$ .

Peebles (1975) in the monography ascertains [14] (p. 162): "... Microwave background radiation, probably, has peak about(near) lengths of a wave  $\lambda = 1 \text{ mm}$ ".

### The Physical Nature of Microwave Background.

In the hierarchy set of electronic temperatures  $T_*^{[s]}$  (see Table) it is uneasy to note the temperature  $T_*^{[3]} = 2.900 \text{ K}$ , adequate to  $C_*^{[3]} = 11.483 \text{ km} \cdot \text{s}^{-1}$  and coincide with observable temperature of microwave background  $T = 2.9 \text{ K}$ .

Not casual character of the marked conformity is emphasized by the following statement which supposes by wide experimental, observational and conceptual substantiation.

**Proposition.**

1. Experimentally observed microwave background induced by wave (megawave) dynamic processes in cosmic (interstellar, interplanetary) medium (plasma) and directly it is connected to its fundamental characteristic – phase velocity of propagation of perturbations (megawaves)  $C_*^{[3]} = 11.483 \text{ km}\cdot\text{s}^{-1}$  (sound velocity), dominate in  $G^{[3]}$  Shell in observed Hierarchy of astronomical systems.

2. According to it the microwave background  $F^{[3]}$  characterized, in particular, by electronic temperature

$$T_e^{(\text{micro})} = T_*^{[3]} = (m_e/3k)(C_*^{[3]})^2 = 2.90 \text{ K},$$

by the length of a wave of the maximal intensity of radiation  $\lambda^{(\text{micro})} = \lambda_*^{[3]} = b/T_*^{[3]} \cong 1 \text{ mm}$  (see Table).

**POLYPHONY OF THE UNIVERSE.**

Inevitable and natural consequence of the previous consideration the following statement is

**Proposition.**

1. Alongside with existence of microwave background  $F^{[3]}$  in the Universe, should exist (detected in experiments) Hierarchy of others backgrounds  $F^{[s]}$ , closely connected with wave dynamic structure and with Hierarchy of  $G^{[s]}$  Shells astronomical systems and, thus, - with Hierarchy of appropriate phase velocities  $C_*^{[s]} = C_*^{[1]}/\chi^{s-1}$  propagation of perturbations (megawaves) in space plasma – velocity of sounds.

In other words, it is necessary to speak about presence of potentially observed Polyphony of the Universe in same concrete sense, as well as about existence of widely known microwave background.

2. The Hierarchy of this  $F^{[s]}$  backgrounds is characterized, in particular, by electronic temperatures

$$T_*^{[s]} = T_*^{[1]}/\chi^{2(s-1)}$$

( $\chi = 3.66(6)$ , in power units  $T_*^{[s]}[\text{ev}] = T_*^{[s]}[\text{K}^\circ]/11604.5$ ), by the lengths of waves of the maximal intensity of radiation  $\lambda_*^{[s]} = b/T_*^{[s]}$ ,  $s=0,+1,+2,\dots$

In connection with told it is necessary to expect the detection, often, the following (besides microwave  $F^{[3]}$ ) backgrounds (terminology corresponds to characteristic lengths of waves  $\lambda_*^{[s]}$  in  $G^{[s]}$  Shells):

Long-wave backgrounds  $F$  [10],  $F$  [9] etc.;

Middle - wave background  $F$  [8];

Short-wave background  $F$  [7];

Ultra short-wave backgrounds  $F$  [6],  $F$  [5],  $F$  [4];

Infra-Red backgrounds  $F$  [3] (microwave),  $F$  [2],  $F$  [1];

Optical background  $F$  [0];

Ultra-Violet backgrounds  $F$  [-1],  $F$  [-2];

X-Ray backgrounds  $F$  [-3] (soft),  $F$  [-4] (rigid);

Gamma - backgrounds  $F$  [-5] (soft),  $F$  [-6] etc.

**Backgrounds Isotropy.**

Within the framework of representations of the Wave Universe concept naturally becomes clear observed fundamental physical properties as microwave  $F^{[3]}$ , and others (for example, X-Ray) backgrounds  $F^{[s]}$  - them *isotropy, uniformity, uniform filling* by all heavenly sphere, them *diffuse* character.

It - inevitable consequence of the fundamental dynamic property - isotropy of space ( interstellar, interplanetary) medium: distribution of perturbations (Megawaves) in it is isotropy, their phase velocities (sound velocities) are identical to any directions of propagation, etc.

**The Microwave background of Solar (planetary) system and satellite systems of planets.**

Representations discussed above about presence in astronomical systems of Backgrounds Hierarchy

chy may be sufficiently are definitely verified and on data of the most exact given objects of near space.

For example, it is necessary to expect, that microwave background  $F^{[3]}$  of Solar (planetary) system is connected to its  $G^{[3]}$  Shell (i.e. with the Trans – Pluto Shell following  $G^{[1]}$  Shell - Terrestrial and  $G^{[2]}$  – Jupiterian, associated with zones of planets I (Terrestrial) and II (Jupiterian) groups, and medium dominate here. The space plasma in  $G^{[3]}$  Shell characterized by temperature  $T_*^{[3]} = 2.9$  K and the  $C_*^{[3]} = 11.483$  km·s<sup>-1</sup> sound velocity. Similarly, for example, microwave background  $F^{[3]}$  of the Jupiter system is connected to  $G^{[3]}$  Shell, in which there are its satellites J13, J6, J10, J7; J12, J11, J8, J9.

### **Microwave background of the Earth. Accident or law?**

Even during opening microwave background of Penzias and Wilson [15] the phenomenon - diffuse radiation of near space – was known. This diffuse radiation of space ("atmosphere", terrestrial components) also with temperature near  $T \sim 2 \div 3$  K, delivered a lot of efforts to pathbreakers ( as, however, - and to the subsequent researchers).

Peebles [14, c.150] notices in this occasion:

"... Intensity of (radiation) an atmosphere is approximately constant and corresponds 2 - 3 K on lengths of waves there are more than 2 cm, so corrections on Atmosphere at measurements from a surface of the Earth are approximately equal to measured value...

Apparently, it is standard, that coincidence of atmospheric temperature with  $T$  (of microwave background) *is casual...* "

Developed representations enable to understand genesis and own microwave background  $F^{[3]}$  of the Earth - Moon satellite systems, as diffuse radiations of its  $G^{[3]}$  Shell temperature  $T^{[3]} = 2.9$  K sound velocity of space plasma  $C_*^{[3]} = 11.483$  km·s<sup>-1</sup>, laying in pre – Lunar space, non – accidentness - law of a phenomenon of coincidence of temperatures maximal intensity of circumterrestrial and far space components an observed microwave background.

### **OBSERVATION OF DIFFUSE BACKGROUNDS.**

The observed data available now about existence of diffuse radiations in the Universe allow to lead(carry out) the preliminary, not full comparison of consequences of the theory with some of known observations.

#### **Diffuse Radio Background.**

From times of pioneer researches of Jansky (1932) it is known, that "... The galaxy is a source of intensive Radio emissions on frequencies in tens megahertz. An origin of this radiation remained *not clear...* " [16, c.12].

Satellite researches have considerably expanded a range of observations. Already in early observations on the satellite RAE – 1 [17], and also [18], on low frequencies it was revealed, that maximal intensity of radiation in a direction on the anticentre of Galaxy lays in a range 3 - 10 MHz (see also Fig. 1.6, p. 40 in [16]). It characterizes a point of inflection of a spectrum - on more low frequencies the spectrum has an inclination  $\alpha = 1.5 \pm 0.1$ , on high fall from  $\alpha = -0.5 + 0.1$ .

It is interesting to compare such data to presence diffuse radio Background  $F^{[7]}$  with  $\lambda_*^{[7]} = 32.644$  m and corresponding frequency  $\nu_*^{[7]} = 9.183$  MHz.

According to [16, page 35], "... Low-frequency observation of North Shpur [19] have shown, that its intensity in range from 17.5 up to 81.5 MHz is lower, than environmental background, as If radiation absorbed, whereas on higher frequencies (~ 1440 MHz) spectrum more abruptly, than in environmental areas. From here follows, that shpurs are quite precise objects, separated from a back-

ground... "

Observations of recombination radiolines of the interstellar environment have shown, that they have feature - assymetry, presence of narrow detail from the high-frequency side [16, c.126].

It is supposed, that they belong to carbon, are formed, faster, in the interstellar environment, than in areas HII.

It is interesting to note, that a detail (attributed to carbon C157 $\alpha$ ) a merging structure of lines of hydrogen and helium in Orion Nebula lays in area 1684 MHz (see also Fig. 3.14 [16]).

According to Dupree and Goldberg [20] such line intensify due to influence of intensive background radiation of HII region.

Spectra of Orion B and IC1795 on the wave of  $\lambda = 18$  cm also displays presence of a detail (line of "carbon (?)" - from high-frequency the sides) [21].

It is possible connection of observation with presence of Radio Backgrounds  $F^{[6]}$  with  $\lambda_*^{[6]}=2.428$  m,  $\nu_*^{[6]} = 123.467$  MHz and  $F^{[5]}$  – with  $\lambda_*^{[5]} = 18.06$  cm,  $\nu_*^{[5]} = 1659.947$  MHz.

### Infra-Red Diffuse Bbackground.

In the literature [22] nature of found out by Matsumoto et al. in 1982 (with use cooled optics on rockets) diffuse infra-red radiation in range of  $2 \div 5$  microns [23] is discussed. After a deduction of the contribution of known diffuse sources, the density of energy of a residual background appears comparable with density of energy of a microwave background.

These observation are quite comparable to consequence of the theory about existence diffuse IR - background  $F^{[1]}$  with  $\lambda_*^{[1]} = 5.527$  microns.

In the rocket observations [24] which have been carried out in 1983, so It was revealed in a near IR - range ( $\lambda = 1 - 20$  microns) excess background radiation, which spectrum reminds blackbody with  $T = 1500$  K.

According to measurements IRAS [25], the diffuse galactic component of a IR - background prevails on length of a wave close to  $\lambda = 100$  microns, except for area of the ecliptic plane.

It is possible, that more exact localization of this component will result to the value close to  $\lambda_*^{[2]}=74.318$  micron, adequate to  $F^{[2]}$  background.

It is observed as well diffuse galactic and extra - galactic radiation in far infra-red area  $\lambda = 350 - 3000$  microns [26]. Obviously, component  $\lambda \sim 1000$  microns should be connected with  $\lambda_*^{[3]} = 999.17$  microns, appropriate to  $F^{[3]}$  microwave background.

### Diffuse X - Ray Background.

"Since 1962 it is known, that any site of the sky lets out homogeneous X - Ray radiation, and this "luminescence" is uniformly fills the sky. After two decades amplified(strengthened) investigations an origin of diffuse X - Ray background still is thawn by a subject of sharp polemic.

The firmament appears uniformly bright at observation only in one area of an electromagnetic spectrum - microwave. It is interesting, that microwave background radiation (it name also *relic*) it was open in 1965, soon after the first observation of X - Ray background radiation... "

"... Area of EM spectrum in which it was revealed cosmic X - Ray radiation - an interval of waves lengths from 1 up to 10E, - completely absorb by terrestrial atmosphere ", - ascertains Margon [27].

The X - Ray background opened by Giacconi et al. [28], is isotropic, at least, to within 3% in angular scales exceeding  $15^\circ$  [29]. During the further researches amplitude of there anisotropies was considerably it is lowered.

It is interesting to notice as the destiny of diffuse X – Ray Background it strikingly differs the opening made for *three years after* (opening of Penzias and Wilson of microwave background), - that means " to not get in a resonance " with expectations of dominate representations.

According to [30, c.189-192]:

"... In a soft range, about(near) 0,25 keV, for example, show rather bright spots of a background on high galactic latitudes, meanwhile, as in a plane of the Galaxy the background is weakened.

... In soft background radiation are found out emission lines, characteristic for hot plasma. On lines CV, CVI, OVII and OVIII it was possible to estimate and temperature - near  $1.1 \cdot 10^6$  K".

The survey of the X - Ray sky (80 % of heavenly sphere) by SAS 3 [31] specifies the existence of a soft X - Ray background in energy Interval 0.10 – 0.28 keV.

Above mentioned observations of a soft X - Ray background quite correspond to theoretically computable background  $F^{[-2]}$ , laying on border of a Ultra - Violet and X - Ray range.

This background is connected to  $G^{[-2]}$  Shell of astronomical systems, characterized by the sound velocity of space plasma  $C_*^{[-2]} = 7610.67 \text{ km}\cdot\text{s}^{-1}$ , temperature  $T_*^{[-2]} = 1.273 \cdot 10^6 \text{ K} = 0.109 \text{ keV}$ , the length of a wave  $\lambda_*^{[-2]} = 2.274 \cdot 10^{-9} \text{ m} = 2.274 \text{ E}$  of maximal intensity of radiation. Preliminary results of rocket observations [32] testify as well to presence of diffuse soft X - Ray background in area 0.3 – 1.5 keV.

It is interesting the comparison of these data with characteristics of Soft X - Ray background  $F^{[-3]}$ :  $C_*^{[-3]} = 27905.8 \text{ km}\cdot\text{s}^{-1}$ ,  $T_*^{[-3]} = 17.127 \cdot 10^6 \text{ K} = 1.475 \text{ keV}$ ,  $\lambda_*^{[-3]} = 1.691 \cdot 10^{-10} \text{ m}$ .

Satellite measurements (on HEAO 1 and A2) are discussed the diffuse X - Ray background and in the energy range 2 - 60 keV [33]. The amplitude of anisotropy is maximal ( $\delta = 0.75 \pm 0.38\%$ ) for energy  $E = 20 \text{ keV}$  in comparison with  $E = 10$  and  $60 \text{ keV}$  (accordingly  $\delta = 0.37 \pm 0.22$  and  $0.33 \pm 0.55\%$ ). Comparison of these observations is possible with (Rigid) X - Ray background  $F^{[-4]}$  ( $C_*^{[-4]} = 102321.31 \text{ km}\cdot\text{s}^{-1}$ ,  $T_*^{[-4]} = 230.26 \cdot 10^6 \text{ K} = 19.842 \text{ keV}$ ,  $\lambda_*^{[-4]} = 1.258 \cdot 10^{-11} \text{ m}$ ).

### Diffuse Gamma Background.

The information about diffuse radiations laying in gamma range it is connected to exoatmospheric observations.

For example, Ballone observations in equatorial latitudes (in Brazil), proceeding 6 hours, confirm presence of diffuse gamma - radiations in a range 0.28 – 4.35 MeV [34].

It is possible the comparison of these data with theoretically calculated diffuse gamma backgrounds  $F^{[-5]}$  ( $T_*^{[-5]} = 0.266 \text{ MeV}$ ) and  $F^{[-6]}$  ( $T_*^{[-6]} = 3.586 \text{ MeV}$ ).

Careful comparison of available data of satellite measurement (OSO - 3, SAS-2, COS-B etc.), the further satellite investigations and comparison to predictions of the theory in a range superrigid radiations may result in interesting conclusions.

### Dominant Surpluses of Radiation.

By way of illustration, showing an opportunity of interpretation of observed surpluses of radiation - as appropriate to physical distinguished - dominant (strongest of elite) states (movements) of a matter - space plasma, we conduct only some data concerning a IR - range.

According to IRAS observations, radiations in a IR - range dominate, in particular, on lengths of waves  $\lambda = 12, 25, 60$  microns for exception of area of a galactic plane. Galactic component prevails on length of a wave  $\lambda \sim 100$  microns, behind exception areas of a ecliptic plane [25].

It is discovered features (details) on  $\lambda = 3.28; 6.2; 7.7; 8.6; 11.3$  microns [35].

The new information has caused a series of the publications connected with interpretation of "non-identified" IR emission details by dissipation (dissemination) of *interstellar dust* [35] and even by components of organic origins (according to hypothesis of Hoyle-Wickramasinghe).

Meanwhile, the analysis shows an opportunity of interpretation of observed surpluses of radiation as *dominant* - in concrete, sense discussed above.

Really, according to a relation for elite lengths of waves, observed surpluses of radiation for  $[\lambda = \lambda_N^{[s]}, N = N^{[s]} = (2\pi\lambda/\lambda_*^{[s]})^{1/2}]$

$\lambda = 7.7$  microns ( $N^{[0]} = 10.847$ , near  $N_{Dom} = 11$ ),

$\lambda = 11.3$  microns ( $N^{[0]} = 13.14 \sim N_{Dom} = 13$ ),

$\lambda = 25$  microns ( $N^{[0]} = 19.545 \sim N_{Dom} = 19.5$ ), and also

$\lambda = 60$  microns ( $N^{[1]} = 8.25 \sim N_{Dom} = 8$ ),

$\lambda = 100$  microns ( $N^{[1]} = 10.66 \sim N_{Dom} = 11$ )

may be interpreted, as adequate to (strong) *dominant* states (movements of space plasma) in  $G^{[0]}$  and  $G^{[1]}$  Shells accordingly.

Besides, as (be simple) elite may identified the surpluses at  $\lambda = 3.28$  microns ( $N^{[0]} = 7.079 \rightarrow N=7$ ),  $\lambda = 8.6$  microns ( $N^{[0]} = 11.463 \rightarrow N = 11.5$ ) in  $G^{[0]}$  Shell.

As a whole as show the further researches, similar Image the situation for other ranges looks also.

It is possible to show, that detected in observations surpluses of radiations in all a foreseeable range of frequencies suppose the correct description - as *dominant - physically distinguished*, it connected with prevailing and mainly observed movements of space plasma.

## DISCUSSION.

Representations considered above result to a wide spectrum of consequences.

One of them consists in the following:

### Proposition.

i) Genesis of observed in the Universe diffuse backgrounds (radiations) it is closely connected with dynamic - *wave (megawave)* structure of astronomical systems of any scales, appropriate to all Hierarchy of Universe.

ii) Diffuse Backgrounds in the Universe exist, are observed (and, thus, in the conceptual plan, - may be thought) only as an *intrasystem* phenomenon.

In other words, it is necessary to understand, that genesis of diffuse backgrounds (radiations) has essentially *intrasystem* character, they are formed, stabilized, exist in frameworks of corresponding Shells of astronomical systems of any scales (from planetary systems up to superclusters of galaxies), and them physical characteristics are closely connected to physical characteristics of dominate component of space plasma in Shells, including, - with sound velocities in polycomponent space plasma.

Other conclusions - obvious enough and not less important (including, - general-theoretical character) - is meaningful certainly to discuss only after detailed, wide comparisons of concrete consequences of the theory and observations, including, - after of new high-frequency data of purposeful space experiments on detecting of Backgrounds Hierarchy (Polyphony) of Universe.

Nevertheless, already now (and without dependence from effectiveness of representations discussed above) a problem of adequate understanding and interpretation of observed Hierarchy of diffuse backgrounds and surpluses of radiations in the Universe may, apparently, to be considered as one more symptom of that "from Astronomy already it is necessary to expect in the near future revealing new facts which will demand the formulation of new physical theories more general, than known now. " [37].

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## POST SCRIPTUM 2001.

After more than fifteen years after representation of the Wave Universe Polyphony concept [Chechelnitsky, 1986 a,b,c] significantly enlarge the massive of observed and experimental information, concerning existing, distinct(clear) display of set of diffuse backgrounds.

But thus, despite of an abundance as well theoretical researches, essentially nothing has changed in conceptual judgement of an observed phenomenon [see Lasenby and Hancock, 1977; RPP, 2000].

### The Problem of Plurality Backgrounds.

Standard Cosmology, as before, with persistence, worthy the best application, it continues "to be trampled down", basically, *around of a microwave background*, in many respects (in conceptual plan) ignoring the manifestation of others backgrounds.

And it that observations and experiments more and more persistently continue to remind of their existence.

The objective sight shows, that a phenomenon of plurality backgrounds as before remains *Infant Terrible* of Modern theoretical cosmology.

So strange aberration of conceptual sight, certainly, has the explanation.

### The Problem of the Heritage (Relict).

Why the standard theory peers only in the microwave background?

Yes because there are "fathers - founders" of Modern cosmology the opinion was stated - observed microwave background it – the *heritage, the rest - relict* of Big Bang and practically the *most essential argument of a reality* so ancient and extreme event. In a science, as well as in a policy(politics), frequently, the most simple, at times, primitive, "clear" opinion usually uses also the greatest popularity.

But if microwave background is a relict, *why the others backgrounds are not relicts*, heritage of Big Bang?

Similar questions are not put at all - you see they strongly complicate the usual "harmonous" argumentation.

### The Problem of Backgrounds Stability.

Meanwhile, it is obvious, that if microwave background, as and all others backgrounds, were not created *continuously, in constant mode, here and now* in the Universe, i.e. were not steady actually being continuous stationary process, they would be "disorganized", dissipated, *would lose stability Immediately, today*, instead of that were kept from times, be aparted on billions years back.

Naive concepts such as the Heritage (Relict) have no prospects if they do not base on representations of *actualism* - stability, dynamic equilibrium of permanent and simultaneously going on processes of genesis and dissipation.

### The Invisible Questions, Not - Heard Answers.

The insist challenge to standard cosmology, for example, the summary picture of observed backgrounds in the Universe is [see Longair, 1984, pp. 202-203, Fig. 15.13; Longair, Sunyaer, 1971] or it modern analogues.

It is not audible answers to naturally arising questions:

\* Why this summary picture of Backgrounds in the Universe has so *freakish nonmonotonic* character?

\* What this so strange superposition of a sequence of bell - shape curves?

\* What physics stands up for it?

\* What laws here work?

\* Than are defined(determined) also to that positions are equal, for example, extremums of observed backgrounds (temperatures, energy, length of waves, frequencies extremums)?

\* Whether it is possible to specify, proceeding from any First Principles, why, for example, extremum of the microwave background falls to length of wave namely to  $\lambda = 1$  mm and temperature  $T \sim 2.8 \div 2.9$  K?

\* Etc...

Answers it is not audible, it is probable, and consequently, that these questions do not arise (and evidently, may not arise) in bowels of habitual representations - within the framework of smooth, monotonous models, for example, of Standard Cosmology (Expanding Universe).

But all these and other questions attempt to give the answer the concept of the Wave Universe (and its Polyphony) [Chechelnitsky, 1980 – 2001].

No doubt, that only a free, fair competition of Ideas and unbiased discussion may promote the decision of the basic, fundamental problems, facing Theoretical cosmology.

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