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THE OPERATIVE CONTROL ECOLOGIES OF THE ATMOSPHERE

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The summary

This work is the further development of researches of the author.

Results of researches are rather important for statement of the round-the-clock operative control of a transparency of an atmosphere by the compact inexpensive device.

Continuous research of pollution of an atmosphere is round the clock considered with the help of the small-sized detector for short enough exposition time.

The project of the detector measuring a transparency of an atmosphere on fluctuations of a stream of secondary particles from space beams, is submitted in the present(true) work.

Keywords: transparency atmosphere fluctuations stream of secondary particles from space beams,

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Fluctuations of density of a stream of secondary particles

Primary particles ultrahigh energy, passing through an atmosphere of the Earth, create a stream of the secondary relativistic particles generating radiations of several kinds (Fig. 1.).

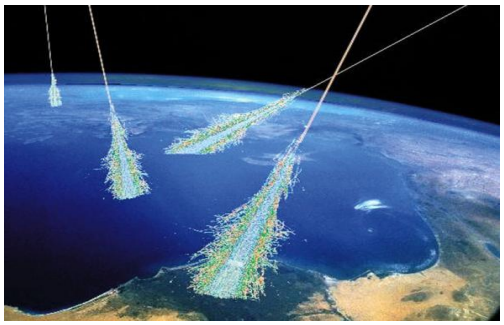

Fig. 1. A kind from space of a "hot" trace at passage of a primary particle to an atmosphere.

The author investigated a power spectrum of primary particles on a stream cherencov radiations in an atmosphere [1] with the help of the big optical detector designed by him(it) [1]. The author on integrated fluctuations of number cherencov flashes had been created the theory of a transparency of an atmosphere [1] and the method of the operative control of a transparency [1] is created, on installation EAS the transparency of an atmosphere is measured in Yakutsk [2] and Samarkand [2].

The analysis of the data received by the author results in the following.

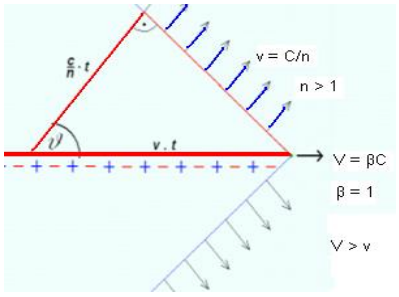

Fig. 2. Triangle of Frenel for relativistic particles in an atmosphere of the Earth.

Particles ultrahigh energy are relativistic and possess speed v0 = βC, where relative speed β = 1. Speed of distribution of an electromagnetic signal in v environment = C/n, where n> 1.

That is speed of a particle is more than speed of light in the environment: v0> v (Fig2).

This inequality is a condition of radiation of Vavilov - Cherencov.

Processes of interaction of relativistic particles with atoms of an atmosphere are coherent.

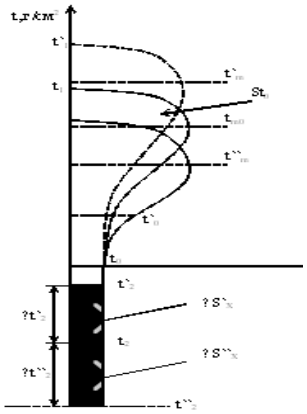

Fig3. The stream of secondary particles

Hence, relative fluctuations of density of a stream of secondary particles correspond(meet) to relative fluctuations of density of a stream cherencov radiations

Also characterize relative fluctuations of an integrated stream of primary particles Ni/N1 [2]. $T_i = T_1 (N_i / N_1)^{1/\kappa}$.

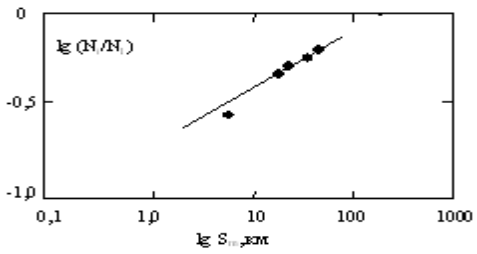

Fig. 4. Visibility range and an integrated stream of primary particles.

4 <Sm <50 km. $\frac{N_i}{N_1} = (0{,}175 \pm 0{,}02) \cdot S_m^{0{,}33 \pm 0{,}02}$,

The observer registers various density of a stream of secondary particles of downpours from particles with identical energy primary depending on pollution of an atmosphere. (At stable sensitivity of the detector a bad transparency the part of downpours is not registered. At the best transparency the integrated stream of primary particles is maximal).

Transparency atmospheres for the given concrete time interval [3]:

Where n1 the maximal density of a stream of particles at the best transparency T1,

$T_i = T_1 (N_i / N_1)^{1/\kappa}$.

Correlation of fluctuations of integrated intensity 15-munit spectra Ni/N1 with visibility range Smi measured during the same periods of registration on a meteorological station in the same region by [4.] us is received:

2. The detector.

The project of the compact detector operatively supervising a transparency of an atmosphere **round the clock** is offered.

The detector is designed as the tight container with scintilation, taking place on distance from the photo multiplier within the framework of his(its) apertures (Fig. 5).

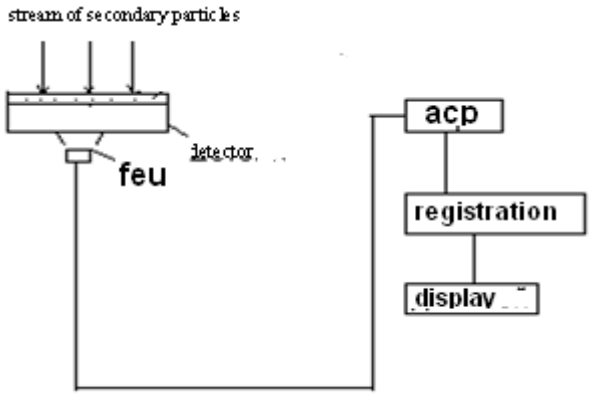

Fig. 5. The block diagram of the detector of the continuous control of a transparency of an atmosphere.

Sensitivity of the photo multiplier is adjusted on the minimal integrated intensity of a stream of primary particles that corresponds(meets) to minimal reaction FEU. The signal from FEU acts on logarithmic analog - digitizer (ACP). Step ACP is selected in such a manner that for a decade of a power range 10 logarithmic intervals are allocated(removed). Range AC P makes 4 order.

The registered spectrum is deduced on the display and fixed in long-term memory.

The conclusion.

The continuous control of a transparency of an atmosphere indoubtedly has huge value in ecology (practically in all industries, in particular in space directions).

The detector considered in given clause(article) undoubtedly has advantage before now in use methods. The basic from them is simplicity and compactness of the detector, and also efficiency of the control of a transparency of an atmosphere all day and night.

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