



SOME PROBLEMS OF THE DETECTION OF THE HIGH ENERGY GAMMA-RADIATION IN SPACE

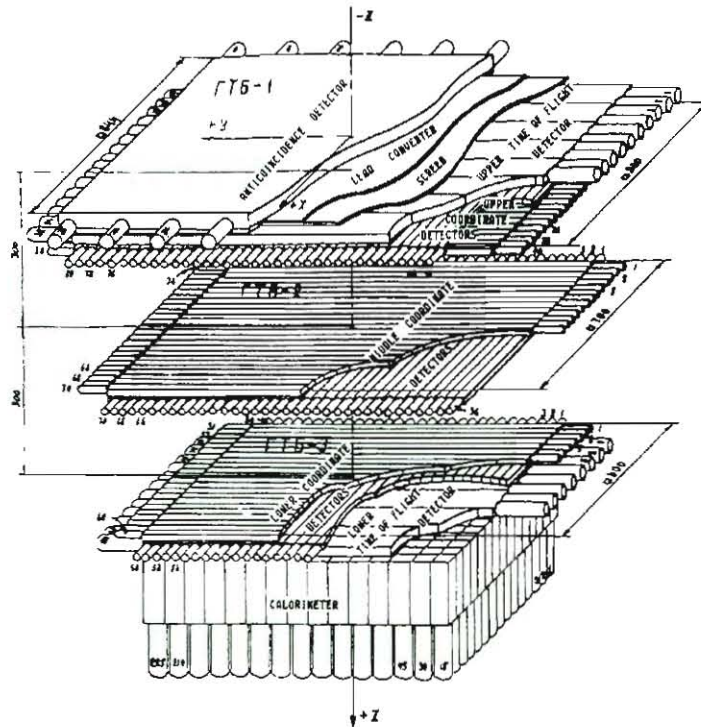
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The flux of the diffuse gamma-radiation in the Galaxy was measured with the instruments on board of the satellites COS-B and Compton Gamma Ray Observatory (CGRO). It was shown that the spectrum of the diffuse gamma-rays $N(E)$ in the energy range from very low energy (some tens keV) up to some GeV may be represented by the expression $N(E) = AE^{-k}dE$, exponent k being equal to 1.9 /1/. In the energy range from some GeV up to about 30 GeV the exponent k changes and become equal to 2.4 - 2.6 /2/. There is no experimental data at higher energies though this problem is very important from the point of view of the dependence of the gamma-ray spectrum on the spectrum of the primary cosmic rays and possible existence of the neutralinos, hypothetical supersymmetrical particles, which are supposed to constitute dark matter in the Galaxy and create gamma-quanta in the process of annihilation.



GAMMA-RAY TELESCOPE GAMMA-400

Our collaboration GAMMA-400 is working on the design of the Gamma-telescope for gamma-ray measurements in the uninvestigated energy range 10 - 1000 GeV /3/. The detectors of the device are shown in the Fig.1. All detectors of the GAMMA-400 telescope are scintillators or cherenkov radiators which are reliable and simple enough devices. The electronics of GAMMA-400 gives the possibility to determine the direction of the gamma-ray, to measure its energy and to eliminate some hindering effects, in particular the influence of the back scattered gammas emitted

by the very massive calorimeter (calorimeter albedo). The total weight of the device is about 750 kg. The experiment GAMMA-400 is agreed to fly on board of the Russian satellite NIKA with a circular orbit of height of 300 - 400 km.

We would like to mention that there are some other proposals (Astrogam /4/, AGATE /5/, GLAST /6/ and others) for such investigations but, in our opinion, GAMMA-400 project is the simplest one and it may be realized in the nearest future if the economic conditions in our country are favourable.

The members of the collaboration GAMMA-400 are: P.N.Lebedev Physical Institute of the Russian Academy of Sciences (FIAN), Moscow Engineering Physics Institute (MEPI), Institute of the Nuclear Physics of the Moscow State University. Principal Investigators: Acad. Vitaly L. GINZBURG, Prof. Lidiya V.KURNOSOVA. This project is supported by Russian FFR. The collaboration GAMMA-400 is open for scientists who wish to participate in the project.

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