is possible that unlike [1 - 3], where larger reflection coefficients were registered and were found to increase with increasing energy, in our case, owing to the higher heat of sublimation, the matter evaporated ahead of the main pulse forms a cloud with a lower optical density. Then the increase of the contrast in the devices that irradiate the easily-evaporated substances should lead to a decrease of the reflection.

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FLARE OF COSMIC GAMMA RADIATION AS OBSERVED WITH "COSMOS-461" SATELLITE

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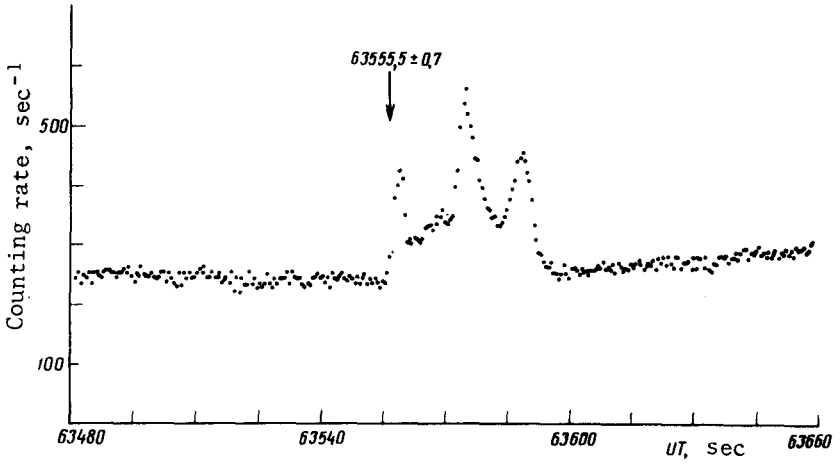
Results are presented of a cosmic gamma-radiation flare observed on 17 January 1972.

Measurement of the intensity of gamma radiation in the 0.2 - 1.5 MeV range, performed simultaneously on several "Vela" satallites, have revealed rare short burts of intensity of cosmic gamma rays, and yielded estimates of the possible directions of their sources [1]. The small time scales of the observed events, which impose limitations on the source dimensions, as well as energy considerations, suggest that the flares are produced in supernova or nova outbursts, or else that a special class of bursting stars exist in the galaxy [1, 2]. Undoubtedly, more data on the flares are needed to explain the nature of this new astrophysical phenomenon.

One of the flares [1] (event 72-4, 13591 sec UT in accordance with Strong's classification) was observed also from the satellites OSO-7 and IMP-6 [2], the data from which were used to measure the spectral distribution of the radiation in the flare in the 10 - 1000 keV range, and to determine more accurately the direction to the source. There are reported confirmations of a few other events of [1], observed with the IMP-6 [3].

We report here the results of observation of the flare of 17 January 1972 (event 72-1, 63556 sec UT) from the satellite "Cosmos-461," which was equipped with a multichannel gamma spectrometer with an isotropic detector placed on a long bar. The geometric factor of the



Flash of gamma-ray intensity in the range 0.05 - 0.3 MeV.

NaI(Tl) detector was 57.5 cm^2.

The gamma intensity flare occurred at an instant of timme when the spectrometer multichannel analyzer operated in a regime in which data were extracted on a previously-measured spectrum. We have at our disposal, however, measurement data obtained during the time of the flare in two wide energy channels of the instrument, 0.05 - 0.3 MeV and in the 4-MeV region, and also data from an intensity meter operating in the 50 - 300 keV range.

The intensity-meter results are shown in the figure. It is seen from the figure that the flare is distinctly visible against the summary background of the diffuse cosmic gamma radiation and of the albedo of the earth's atmosphere, and comprises a sequence of three pulses with total duration 37 sec. The diagram does not show the possible temporal fine structure, since the total time constant of the intensity meter and of the telemetry channel amounted to about 2 seconds.

The starting time of the flare, 63555.5 sec UT, agrees well with the cited time of start of the events 72-1. The total number of detector counts registered in the flash is about 5×10^3. When account is taken of the detector efficiency, this corresponds to an energy flux, in the 50 - 300 keV range, integrated over the time of the flare, amounting to $\sim3\times10^{-5}$ erg/cm^2. The readings of the intensity meter and the data of the wide differential channel 0.05 - 0.3 MeV, in which the measurements are averaged out over an interval of 18 sec, are in full agreement. No statistically significant changes of the counting rate were noted in the 4-MeV region. If it is assumed that the spectrum of the flare is similar to that measured in [2] and follows a power law $\propto E^{-\alpha}$ with α = 1 - 1.5, and then falls off rapidly at photon energies 700 - 800 keV, then the total energy flux in the flare can amount to $(7 - 9)\times10^{-5}$ erg/cm^2.

Simultaneous registration of the flare on the "Vela" satellites and on the "Cosmos-461" satellite obviously precludes the possibility of our having observed an event due to local factors. At the instant of the flare, the "Cosmos-461" was on the part of the orbit illuminated by the sun, at a latitude -5 to -8° and at a longitude 4 - 5°, but the observations of [1] eliminate the sun as the possible source. We note also that according to the data of [4] the activity of the sun was quiet during the day of the observations, nor could we establish any direct temporal connection between the flare and some phenomenon on the sun. We seem thus to be able to state with assurance that the flare comes from a galactic or a metagalactic source.

The fact that the satellite was obscured by the earth during the measurements excludes the possibility that this source is located in a sphere of radius 68° with a center having as coordinates $\alpha \simeq 205°$ and $\delta \simeq +7°$.

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TEST OF THREE SCALING FUNCTIONS FOR $Y_3Fe_5O_{12}$

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By measuring the magnetic properties of $Y_3Fe_5O_{12}$ we calculated the critical exponents for spontaneous magnetization, susceptibility, and the critical isotherm. The calculated critical exponents were used to plot three types of scaling functions, constituting different forms of the magnetic equation of state near the critical point. The scaling functions agree well with the experimental results obtained for $Y_3Fe_5O_{12}$.

The recently obtained extensive experimental data on the physical properties of most substances in the immediate vicinity of the critical points and second-order phase transitions cannot be described within the framework of theories based on representations of an average or molecular (self-consistent) field [1]. Attempts to develop a more satisfactory theory have led to development of the scaling theory [2], which has shown that to describe the singularities of all the thermodynamic quantities it suffices to know two definite critical exponents, in terms of which all the others can be expressed. Scaling theory has demonstrated not only the