EDITOR'S CHOICE

INTERACTION BETWEEN KOZYREV-DIRAC RADIATION AND RADIONUCLIDES

I.M. Shakhparonov

ABSTRACT

Contemporary physics admits the existence of a magnetic monopole in the theories of grand unification, though until recently there have been no evidences of its existence. Having applied a non-trivial approach to a search for a magnetic monopole, the author succeeded in showing that a magnetic monopole is not a rarity in nature and that it, in fact, had been long discovered by Russian scientist N. Kozyrev. In the article we mention the results of earlier published papers by the author on elucidation of the properties of the newly discovered radiation which consists in the flow of magnetic monopoles. The novel data presented bring an indication of the magnetic monopole being very similar to a neutron, on the one hand, and on the other hand, we have demonstrated a possible approach to the fission control with the use of the Kozyrev-Dirac radiation.

INTRODUCTION

In his work [1], predicting the existence of a magnetic monopole, Dirac has found that within the framework of the quantum theory, a quantized electrical charge cannot exist without a magnetic charge. Accordingly, it would mean that the amount of magnetic monopoles in the volume of substance approximates to the amount of atoms in the same volume and that the stability of the substance depends wholly on the presence of such particles in it.

On the other hand, numerous attempts directed at a search for magnetic monopoles had no success. Both experimenters and theorists repeatedly posed the question of their existence in nature. Thus, within the framework of traditional approaches, the problem cannot be solved. Among probable untraditional approaches, the most promising ones seem to be researches held by Kozyrev [2] and Lavrent'ev [3,4], et al., who staged experiments on elucidation of the essence of time. **Magnetic monopole can be viewed as a carrier of properties of time.** The choice is by no means accidental, since a stream of particles of such large mass as that of magnetic monopoles should noticeably distort the space-time metrics, thus affecting the course of cause-and-effect relations. According to the published data, both researchers at a different time came to the same conclusion about the existence of an earlier unknown factor contributing to the transmission of information with infinite velocity in vacuum.

Independently, while investigating the properties of nonoriented contours, the author came to a conclusion that there exists earlier unknown radiation capable of transmitting information with infinite velocity. The discovered radiation had a specific feature, namely, on being absorbed by the substance of the transmitter, it cooled this substance. Within current notions such property appears explicable on a presumption that, in this case, we have to do with the magnetic cooling effect. We may assume that a star, the Sun included, generates a stream of magnetic monopoles traveling with velocities considerably smaller than the velocity of light; in their turn, they distort the metrics forming gravitational waves with the velocity far greater than that of light in vacuum. Moreover, magnetic monopoles, traveling along magnetic lines of force to the center of the Earth, increase its mass and produce an essential effect on atmospheric and tectonic processes. Thus, Kozyrev and Lavrent'ev investigated natural sources of scattered radiation. The author of this report has succeeded in manufacturing a number of concentrators of the new radiation, which ensure stable parameters in laboratory conditions. Taking into account, that the actual discoverer of the new radiation is Nicolai A. Kozyrev, and the theorist who predicted the possibility of existence of such particles was P.A.M. Dirac, the new radiation was called "Kozyrev - Dirac radiation" (KDR) [5].

Besides, we have produced a solid-state magnetic film detector, which allowed us not only to define the trajectories of the radiation carriers and to estimate their energy, but also to show that the particles transform a substance on interaction with it. A good example in this sense is the treatment of a sample of superpure block graphite. Graphite is known to feature clearly pronounced diamagnetic properties. Diamagnetic graphite can be transformed into paramagnetic one by the neutron bombardment of the sample with a total dose of 7×10^{19} neut./cm^2. [6]. This kind of treatment inevitably results in the formation of carbon radioactive isotopes. The exposure of the same carbon sample to KDR resulted in acquired paramagnetic properties but no radioactive isotopes were detected. With a knowledge of the dimensions of the sample, the time of KDR action and the parameters of the KDR concentrator, it is possible to estimate the total mass of particles per pulse which in the neutron equivalent will make 2×10^{14} neut./cm^2 x s. Whether this mass is the mass of one particle or several particles is to be found in later researches.

Until now there exist several models of interaction between a magnetic monopole and a substance. One of them assumes the magnetic monopole to be a catalyst of nucleon decay [7], and consequently can be considered to be an agent in transmutation processes. According to another model [8], a magnetic monopole appears to be a chemical element. All singularities of the magnetic monopole behavior should be well seen in a nonequilibrium (for example, radioactive) substance. This conclusion is driven at owing to a comparative ease of recording the changes in the gamma-spectrum in contrast to other methods. By virtue of the above-cited reasons in 1993 the author carried out the first experiment in this direction with ^{131}I. The experiment has shown an anomalously fast disintegration of the KDR-treated radionuclide (Fig. 1) [9]. Similar results were obtained earlier by other authors [10] in experiments with radionuclide samples in equi-potential electrostatic fields of high intensity produced with the Van de Graaff generator. However, no detailed analysis of nuclear transformations has been made. This report is the first work intended to make up for this annoying gap.

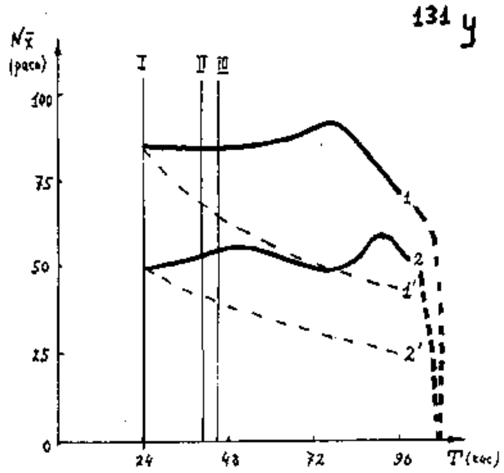

Fig. 1 Disintegration of the KDR-treated radionuclide

EXPERIMENTAL SET-UP

In theory it is known that magnetic monopole can be accelerated in the magnetic field [11]. The increase of energy can be calculated from the formula:

$$E(eV) = 300 \bullet 137/2\ HL,$$

where:

H is the magnetic field induction, G/cm, and
L is the length of solenoid, cm.

While accelerating, the magnetic monopole travels along force lines. With this property in mind, we designed and fabricated an induction accelerator. The accelerator consists of the following parts (Fig.2):

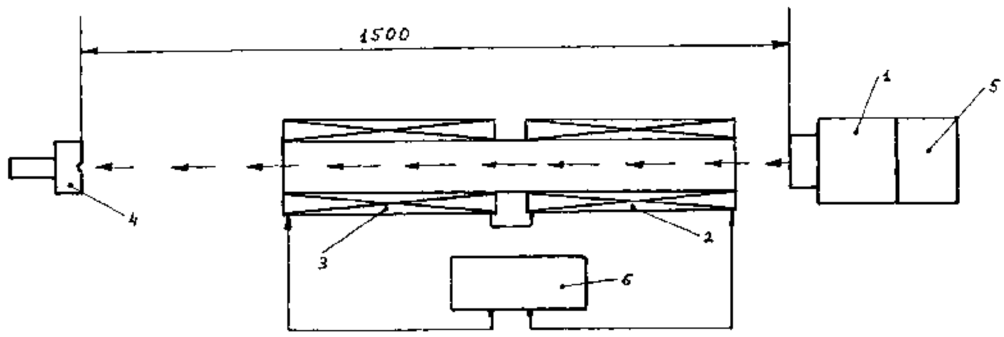

Fig. 2 Induction accelerator

1. A concentrator and a shaper of the beam of magnetic monopoles (KD-radiation);

2. The 1st accelerating section 29 cm long with induction of 628 G/cm. With the current of 10A the monopole energy should increase by $\cong$0.37 GeV;

3. The 2nd accelerating section 39.5 cm long with induction of $\cong$1000 Ge/cm. With the current of 10A the monopole energy should increase by $\cong$0.8 GeV

4. A target in the form of a uranium bolt M12 L22 consisting of a mixture of uranium isotopes (^{235}U, ^{236}U, ^{238}U), subjected to intensive neutron bombardment with a subsequent 5-year seasoning;

5. A power supply of the shaper. An average electrical power is 10 mW;

6. A stabilized power supply of accelerating sections 0-30 V; 0-10 A.

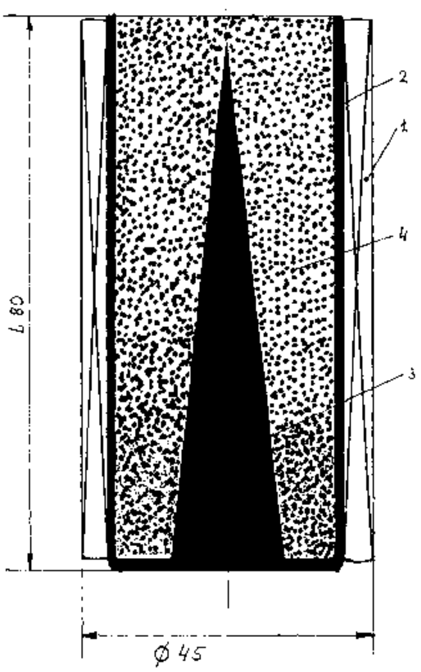

Fig. 3a KDR forming device

The acquisition and the primary analysis of gamma-spectra were carried out on installation ROUS (abbreviation of the Russian "X-ray spectrometry model installation") equipped with a semiconductor detector with the energy resolution 500 eV and the energy detection range from 50 to 2700 keV.

The KDR forming device (Fig. 3) is made of a metal glass (2) with a conic central guide (3). In the body of the glass a nonoriented superlattice (4) is formed with the total number of elements of the order of 10^{10}. Atop of the metal glass an exciting winding (1) is coiled. The distribution of the magnetic field along the length of the device is shown in Fig. 3b. Nanosecond pulses with the recurrence frequency of 20 kHz are applied to the winding.

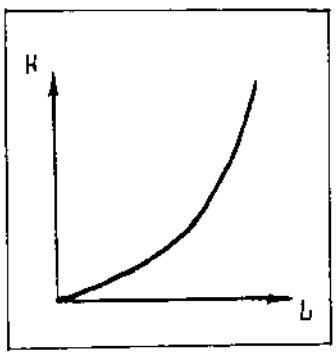

Fig. 3b Distribution of magnetic field

The experimental technique consists in the following:

The preliminary stage envisages careful warming up of the installation, a 4-hour accumulation of the initial spectrum, a spectrum acquisition and its primary treatment. The experimental part includes a 4-hour treatment of the uranium target according to the schedule program followed by production and treatment of the spectrum. Thus, the four basic spectra were obtained: the first is the initial on; the second is the spectrum of the KDR action on the uranium target without acceleration, the third is that of the KDR action, accelerated by the first section; and the fourth is the spectrum of the KDR action, accelerated by two sections. The acquisition of one spectrum in one experiment takes in sum 9 hours (i.e. 4 hours of KDR treatment, 4 hours of spectrum production and 1 hour of its derivation and primary processing).

RESULTS

From the presented histograms of the gamma-spectrum line distribution (Fig. 4), one can see that specific reactions proceed in the uranium target under the action of magnetic monopoles. Unfortunately, because of the incompleteness of the database the gamma-spectrum was not interpreted. However, even what is already available allows us to make definite conclusions. We have paid attention to an absolutely explicit circumstance, that a merely focused KDR beam produces no effect on the gamma-spectrum of the target (histograms 1 and 2). The stable substance did not turn active under the influence of the KDR stream of our accelerator, since the holder of the uranium bolt did not become radioactive after hours of treatment. After the exposure of the target to magnetic monopoles accelerated by the first section, we may notice essential changes (histogram 3). In this mode the changes in the gamma-spectrum basically manifest themselves in the suppression of radiation of, apparently, K and L levels of radioisotopes in the target (37% of the total number of lines of the initial spectrum). Attention should be drawn to the emergence of new lines (5%) and an annihilation line of 511 keV. We attribute the origination of this line to a nucleon decay in the magnetic monopole field. Thus, in this acceleration mode the effect of radiation suppression is much more pronounced than the effect of activation. With a sufficient degree of probability it is possible to predict, that a complete suppression of nuclear reactions in the target is feasible through making use of a more powerful source of KDR and a selection of appropriate acceleration energy. Still greater acceleration of magnetic monopoles by means of an application of two solenoids connected in series brought about an abrupt change in the gamma-spectrum of the sample. Along with still greater number of suppressed lines (45%), there appeared a noticeable amount of earlier unobserved ones (41%). Thus, we see the presence of two competing processes (suppression and excitation). To our opinion, both processes are caused by the interaction of the fields of a magnetic monopole and an atom. Since KDR is

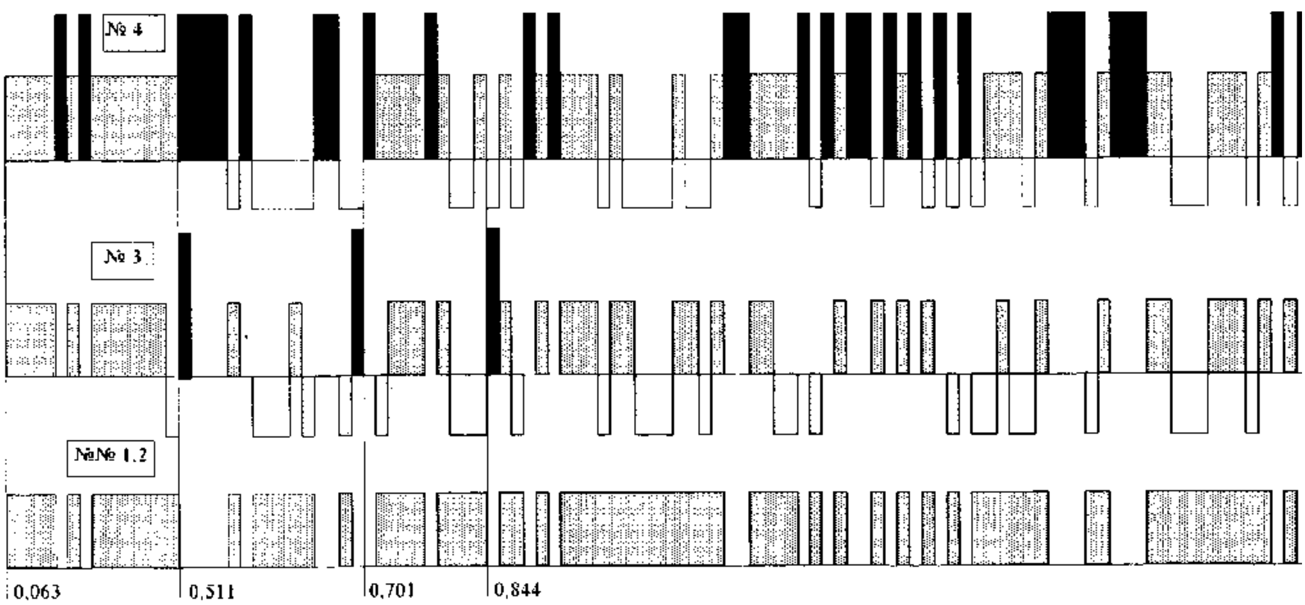

Fig. 4 Histograms of the gamma-spectrum line distribution

polychromatic, the monopoles of different energies can interact differently with nuclei. Therefore, we can assume that through modification of KDR parameters it is possible to achieve a mode of full suppression of the nuclear reaction or, on the contrary, of fast scintillation of the radioactive substance. Further steps in this direction and especially the construction of a cyclic induction accelerator of KDR will test the correctness of our prognoses. The measurements of the activity of radionuclides of the target have revealed its monotonic reduction with each next experiment. Though the activity variation is within 10% of the error, its persistent lessening gives us the right to think that this process is not accidental.

CONCLUSION

Summing up, we can stress out the following characteristic symptoms of the KDR interaction with stable and radioactive substances:

1. Neither focused nor accelerated (up to $\cong$1,17 GeV) KDR activates stable substance.

2. Focused and accelerated in the magnetic field (up to $\cong$0,37 GeV) a KDR beam basically prevents the disintegration of radionuclides.

3. A beam with the energy $\geq$ 0,37 GeV initiates a nucleon decay in the magnetic monopole field.

4. Focused and accelerated in the magnetic field (up to $\cong$1,17 GeV) a KDR beam accelerates the decay of radionuclides.

ACKNOWLEDGEMENTS

I wish to express my sincere gratitude to all workers of the Head Laboratory of Radiation Monitoring and Radiation Physics for their help in the researches and my special appreciation to Sergei Kolotukhin for his selfless labour. But for his persistence, knowledge and energy this work would have never been successfully carried out.

I am indebted to Mr. Vladimir A. Mironov, the General Director of the ATRAN Company, for his timely financial support of this work during the State certification of the measuring complex.
I also consider it my pleasant duty to express my gratitude to the Vladimir V. Eroshenko for the efforts he exerted for the realization of this research, and to Nicolai A. Beljusenko and Oleg V. Inozemtsev for most useful discussions and constructive observations.

REFERENCES:

1. P.A.M. Dirac, Proc. Soc., A133,60 /1931/.
2. N.A. Kozyrev, Selected transactions, LGU, 1991, p 3 (in Russian)
3. M.M. Lavrent'ev, I.A. Eganova, M.K. Lutset, S.F Fominykh, *Reports of AS USSR*, 1990, vol 314, no 2, p 352-355 (in Russian)
4. M.M. Lavrent'ev, V.A. Gusev, I.A. Eganova, M.K. Lutset, S.F Fominyh, *Reports of AS USSR* 1990, vol 315, no 2, p 368-370 (in Russian)
5. Proc. International Scientific Conference, New Ideas in Natural Sciences, *Problems of Modern Physics*, p 176-187.
6. Properties of carbon-based structural materials (manual), Moscow, Metallurgy, 1975, p 73-77 (in Russian)
7. V.A. Rubakov, *Pis'ma v ZhETF*, 1981, vol 33b, p 658 (in Russian)
8. V.M. Galitsky, *Priroda*, 1976, no 4, p 27-31; 1994, p 198 (in Russian)
9. "A Ball Lightning in the Lab" (collected papers), Moscow, Khimia, 1994, p 198 (in Russian)
10. Patent EΠB No 0313073, G21K 1/00, 1989.
11. K.N. Mukhin, "Experimental nuclear physics" vol 1, Moscow, "*Energoatomizdat*", 1983, p 279-281 (in Russian).