DECAY OF ^{152}Eu AND ^{239}Np IN THE PROCESS OF MICROWAVE AND LASER IRRADIATION

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Some experiments, which have been carried out in the frames of "Energy and Transmutation" project and directed to solve tasks of studying the nuclear-physical processes' characteristics, ensuing on nuclei ^{152}Eu and ^{239}Np under the influence of coherent electromagnetic radiance, have been discussed in the report.

The aim of the experiments [1] is to study the mechanisms of influence of electromagnetic radiation of microwave range and laser radiation on the probability of the nuclear decay (curve in Fig.1).

The influence of laser irradiation on the gamma-activity of aqueous solutions of both ^{152}Eu and ^{239}Np is experimentally studied in presence of Au nanoparticles at laser intensity of order of 10^{12} W/cm^2. It is found that laser irradiation reduces the gamma-activity of both nuclides. This decrease is not accompanied by excessive gamma radiation in the spectral range of gamma-activity of their spontaneous decay. Possible mechanisms are discussed of the influence of laser radiation on the activity of isotopes.

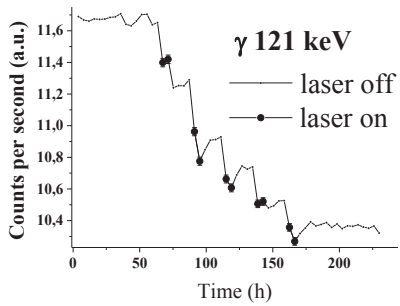

Fig.1.The change in the intensity of the gamma line 121 keV ^{152}Eu.

1. E.V.Barmina, A.V.Simakin, V.I.Stegailov, S.I.Tyutyunnikov, G.A.Shafeev, I.A.Shcherbakov // Quantum electronics. 2017. V.47. P.627.