Mev in the laboratory system, at which a term proportional to $\cos^4\theta$ apparently appears in the angular distribution. From the point of view of the resonance model of pion production in nucleon-nucleon collisions, this means that the p state of the system (isobar nucleon), which precedes the radiation of a meson in the d state, start assuming an important role. In this case the amplitude of the $^1S_0 \rightarrow {}^3S_1$ transition should be small, since this transition corresponds to the d state of the isobar-nucleon system.

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ELECTRON-NEUTRINO CORRELATION IN THE NEGATIVE DECAY OF Na^{24}

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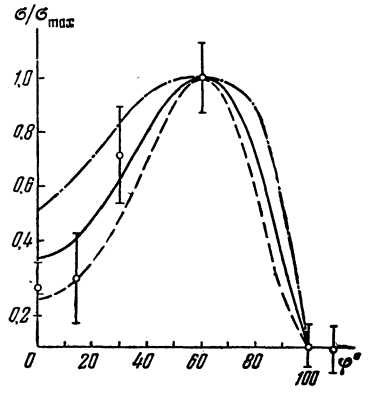
EXPERIMENTS for the determination of the electron-neutrino correlation through the use of resonant scattering of γ rays were proposed in Ref. 1. In the same reference, we calculated the dependence of the additional cross-section of the resonant scattering on the angle between the registered γ quanta for the β^--decay of Na^{24}. We have now carried out experiments using a gaseous source of Na^{24}.

The experimental setup was similar to that used in Ref. 2, with certain modifications. We employed FEU-33 instead of FEU-19 photomultipliers, which made it possible to dispense with broadband amplifiers and reduce the resolution time of the coincidence circuit to 3×10^{-9} sec. The source of γ-rays was metallic-sodium vapor containing radioactive Na^{24}. The source was kept at a temperature of 1,000°, corresponding to ~ 1 atmos vapor pressure of metallic sodium.



Dependence of the cross-section on the angle. Solid curve – $\lambda = 0$, dotted – $\lambda = -1$, dash-dot – $\lambda = 1$

The diagram shows the results obtained. The average value of the correlation constant λ from one series of experiments is -0.3. The values of λ range from 0 to -1 with a probability of 80%.

The measured maximum resonant-scattering cross section at an angle of 120° between the registered γ-quanta was $(3.1 \pm 0.4) \times 10^{-24}$ cm^2.

The lifetime of the level is ~ 2×10^{-13} sec. The estimated average time between two collisions of the recoil nucleus in the source is ~ 10^{-11} sec, and the recoil nuclei can therefore be considered free and the calculations made in Ref. 1 are thus confirmed.

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