Let N_H be the number of σ_π stars of the first step, N_L that of the second, and N_N the number of σ_π stars that remain unseparated. We now choose some additional identification, which may be common to σ_π stars of all types, and denote by n_H, n_L, and n_N the number of σ_π stars in each of the three groups having this identification.† We can then write

$$N_N = M_H + M_L, \quad n_N = (n_H / N_H) M_H + (n_L / N_L) M_L,$$

where M_H and M_L is the number of captures by heavy and light nuclei among the stars of group N. Consequently, the total number of captures by heavy nuclei will be

$$N_H + M_H = N_H + \frac{n_N - (n_L / N_L) N_N}{n_H / N_H - n_L / N_L} = N_H + N_N \frac{\alpha_N - \alpha_L}{\alpha_H - \alpha_L},$$

where α_H, α_L, and α_N is the frequency of appearance of the additional selected identification in groups H, L, and N. Analogously, the total number of captures by light nuclei will be

$$N_L + M_L = N_L + N_N (\alpha_N - \alpha_H) / (\alpha_L - \alpha_H).$$

The foregoing method was tested with 349 σ_π stars, taken from reference 3.‡ The σ_π stars were considered to have an additional identification, if they contained more than one black prong ($N_H \geq 2$). The frequency of capture of pions by heavy nuclei was found to be $(63 \pm 2.8)\%$, which is in good agreement with the results obtained by other methods.[1,2,7,8] It was assumed here that prongless stars are formed in 27% of all cases of capture of π^- mesons[9] and that 13.7% of all the σ_π stars produced in the capture of π^- mesons by light nuclei are prongless.[10] By way of one possible application, it would be interesting to estimate by the same method the frequency of capture of slow K mesons by light and heavy emulsion nuclei.

*Both statements are not true, naturally, in all cases. However, the exceptions are very rare and can be disregarded in practice.

†It is assumed that the indicated third identification is statistically independent of the first two.

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A CORRECTION TO V. M. STRUTINSKIĬ'S PAPER "EXCITATION OF ROTATIONAL STATES IN ALPHA DECAY OF EVEN-EVEN NUCLEI"

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In the calculation of deformation parameters α of even-even nuclei from the relative intensity of α decay into the state $2^+ (\xi_2)$, inexact experimental data, quoted by the author from Gol'din's survey,[2] were employed in reference 1 in a number of cases. Cited below are the parameters α for these nuclei, obtained on repeated calculation, using experimental data on the fine structure of α decay as cited in references 3 and 4. The values of α were also determined as in reference 1 and with the aid of the same curves (similar to those shown in Fig. 2) as were previously plotted for all even-even nuclei considered in reference 1. The daughter nuclei, $\xi_{2(\mathrm{exp})}$, and the values of α for $r_0 = 1.4 \times 10^{-13}$ cm. are successively indicated. Negative values of α are given in those instances when they too can be reconciled with the intensity distribution.

Rn^{218}: 0.04 [4], +0.06, −0.10; Th^{230}: 0.39 [3,4], +0.15;
U^{230}: ∼0.33 [4], +0.12;
U^{232}: 0.45 [3], +0.15; 0.39 [4], +0.13;
U^{236}: 0.32 [2,3,4], +0.12; Pu^{240}: 0.30 [3,4], +0.11;
Cm^{246}: 0.20 [3,4], +0.09, −0.16;
Cm^{248}: 0.18 [3,4], +0.09, −0.16;
Cf^{250}: 0.20 [3,4], +0.08, −0.19.

Values of the deformation parameters for 11 even-even nuclei were also cited in the paper by Gol'din and Ter-Martirosyan[5] (Table IX) where they were obtained as a result of the numerical solution of an initial exact equation describing α decay. A comparison of our results with the values of α obtained by these authors[5] shows that they practically coincide with each other — the deviation does not exceed 10%.

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RESONANCE TRANSITIONS IN PARALLEL FIELDS IN CERTAIN Mn^{++} AND Fe^{+++} SALTS

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KURUSHIN[1] and Kutuzov[2] have communicated that at $\nu \sim 10^{10}$ Cps at room temperature the $\chi''(H)$ absorption curves in certain Mn^{++} and Fe^{+++} salts possess a maximum when investigated in parallel fields (an oscillating magnetic field H_ν directed parallel to a constant magnetic field H). This absorption in parallel fields was explained by a spin-spin relaxation and identified with the phenomenon discovered experimentally by Gorter et al.[3] In addition it was also noted in references 1 and 2 that the experimental $\chi''(H)$ curves do not fit Shaposhnikov's theory.[4]

As is known, for certain Mn^{++} and Fe^{+++} salts[5] in perpendicular fields, at $\nu \sim 10^{10}$ cps and room temperature, a peak due to the forbidden transition from $\Delta m = \pm 2$ is observed in addition to the main resonance peak corresponding to the allowed transition from $\Delta m = \pm 1$. The intensity of this peak is approximately a hundred times smaller than the intensity of the main peak.

Our measurements of $\chi''(H)$ at 9500 Mcs and $T = 295°K$ in $FeNH_4(SO_4)_2 \cdot 12H_2O$ have shown that in the course of a smooth change from perpendicular to parallel fields (the angle between H_ν and H changes from 90° to 0°) the intensity of the peak for the transition from $\Delta m = \pm 2$ increases by approximately one order of magnitude, while the intensity for $\Delta m = \pm 1$ decreases practically to zero. At the same time, the resonance value of the intensity of the constant magnetic field $H = 1680$ oersteds remains unchanged for the transition from $\Delta m = \pm 2$.

On the basis of this experiment, we can draw the conclusion that the maximum absorption $\chi''(H)$ in parallel fields observed by Kurushin and Kutuzov is not caused by spin-spin relaxation, but by resonance. There are grounds to believe that the phenomena discovered by Gorter in parallel fields at lower frequencies of H_ν are also, in a number of instances, due to resonance transitions.

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