that is, the change in the damping can become quite appreciable. As time goes on, the radiation remains only at those angles corresponding to minimum damping.

In conclusion, we give an equation for the amplitude $\chi(t)$ of the radiation from a crystal with cubic lattice at a point the direction to which is given by the vector $\mathbf{m}$, $|\mathbf{m}| = 1$:

$$\ddot{\chi}(t) + \beta \sum_{\mathbf{k}\neq 0} \frac{1}{|\mathbf{k}|} \ddot{\chi}\left[t - \frac{a}{c}(|\mathbf{k}| + \mathbf{km})\right] - \beta \sum_{\mathbf{k}\neq 0} \frac{\mathbf{k}}{|\mathbf{k}|^3}\left(\mathbf{k}, \ddot{\chi}\left[t - \frac{a}{c}(|\mathbf{k}| + \mathbf{km})\right]\right) + 2\gamma\dot{\chi}(t) + \omega^2\chi(t) = 0. \quad (12)$$

The similarity between (7) and (12) gives grounds for expecting that their solutions will also be essentially similar. The described variation in frequency can be observed, in principle, by the procedure proposed by Mössbauer.[2,3]

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*For the approximations made in the derivation of (7), it is also necessary that the condition $1 \pm \cos\vartheta \gg 2\pi\gamma/\omega$ be satisfied; this condition is violated only for angles $\vartheta$ which are exceedingly close to $\vartheta = 0$ and $\vartheta = \pi$.

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## *SCATTERING MATRIX OF NUCLEONS ON A TARGET WITH SPIN 1*

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THE article by Budyanskiĭ[1] contains the general form of the scattering matrix of a particle with spin $\frac{1}{2}$ by a particle with spin 1, and 12 observable quantities are calculated, making up one of the possible complete sets of experiments. It appears to us that this matrix has not been written down quite correctly.

Using the Oehme method[2] we can write the matrix for the scattering of nucleons on any target in the form

$$M = a + b\,\sigma\mathbf{n} + c\,\sigma\mathbf{m} + d\,\sigma\mathbf{l} \quad (1)$$

(the notation is the same as used by Oehme[2]). The coefficients in (1) should have the following form:

$$a = \alpha_1 I + \alpha_2 S_n + \alpha_3 S_m^2 + \alpha_4 S_l^2,$$
$$b = \beta_1 I + \beta_2 S_n + \beta_3 S_m^2 + \beta_4 S_l^2,$$
$$c = \gamma_1 S_m + \gamma_2 (S_n S_m + S_m S_n), \quad d = \delta_1 S_l + \delta_2 (S_n S_l + S_l S_n). \quad (2)$$

If we transform the scattering matrix given by Budyanskiĭ[1] to the form (1), we obtain

$$a = A_1 I + A_2 S_n + A_3 (S_m^2 + S_l^2),$$
$$b = B_1 I + B_2 S_n + B_3 (S_m^2 + S_l^2),$$
$$c = C_1 S_m + C_2 S_n S_m + C_3 S_m S_n,$$
$$d = D_1 S_l + D_2 S_n S_l + D_3 S_l S_n. \quad (3)$$

It is obvious that no general considerations lead to $\alpha_3 = \alpha_4$ and $\beta_3 = \beta_4$. On the other hand, the complete system of orthonormal basis matrices of the spin space of the particle with spin 1 do not contain expressions of the type $S_i S_k$ and $S_k S_i$ individually, but of the type $S_i S_k + S_k S_i$ (see, for example, reference 3), and consequently one must assume $C_2 = C_3$ and $D_2 = D_3$. The number of complex scalar coefficients should actually be 12 (this follows from general relations given by Puzikov[4]), and this is satisfied by the scattering matrix both in form (2) and (3). It is naturally necessary to use the formula (2), and not (3), for all calculations and suitably correct all the expressions for the cross sections, the polarization, and the correlation functions obtained in reference 1.

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