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MEASUREMENTS OF THE SPIN-LATTICE RELAXATION TIMES OF Cr^{3+} *IN CORUNDUM*

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Submitted to JETP editor December 28, 1957

J. Exptl. Theoret. Phys. (U.S.S.R.) **34**, 777 (March, 1958)

KNOWLEDGE of the spin-lattice relaxation times in ferromagnetic compounds has assumed particular significance in connection with recently developed investigations on the production of low-noise molecular amplifiers using ferromagnetics.

We measured the spin-lattice relaxation time for the Cr^{3+} ion in the lattice of corundum $Al_2O_3 - Cr_2O_3$ for the $\frac{3}{2} \rightarrow \frac{1}{2}$ electron transition (Ref. 1).

The measurements were carried out at 9370 Mc at two temperatures ($T = 300°K$ and $T = 77°K$), and the saturation effect in ferromagnetic resonant absorption was observed for the case when the constant field was parallel to the symmetry axis of the crystal.

The values obtained for the spin-lattice relaxation time, $T_1 = 1.4 \times 10^{-7}$ sec for $T = 300°K$ and $T_1 = 7 \times 10^{-4}$ sec for $T = 77°K$, make it possible to conclude that the basic mechanism of the relaxation in this temperature ranges consists of "Raman effect" processes, which lead to a temperature dependence of the spin-lattice relaxation time in the form $T_1 \sim T^{-7}$ (Ref. 2).

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Translated by J. G. Adashko
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CONCERNING THE HYPERON-NUCLEON INTERACTION

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Submitted to JETP editor December 31, 1957

J. Exptl. Theoret. Phys. (U.S.S.R.) **34**, 777-779 (March, 1958)

1. What little is known of the character of the forces between hyperons and nucleons is learned by analysis of hyperfragments or of the interactions between hyperons and nuclei.[1,2]

Parity nonconservation in hyperon decay can be used to study the interaction between hyperons and free nucleons, and also to investigate hypernuclei.

The direct method of establishing the spin-orbit dependence of the $Y - N$ forces can be the observation of the up-and-down asymmetry of the decay products relative to the scattering plane. The fact that the hyperons produced in $p - N$ and $K - N$ interactions are polarized is apparently evidence in favor of the presence of a (LS) dependence of the forces, but for direct proof the up-and-down asymmetry must be observed in the decay of hyperons that are polarized in elastic $Y - N$ scattering.

A study of the up-and-down assymetry with respect to the plane of hypernucleus production can be used to study the structure of the hypernucleus and for a direct determination of the spin of the hyperfragment. Proof that the spins of the baryons are compensated in ${}_{\Lambda}He^4$ would be the absence of such an asymmetry, which would be observed in ${}_{\Lambda}H^3$ at the same time.

2. Let us consider certain consequences of the unitarity and symmetry of the S matrix for $Y - N$ interactions. At Λ^0-particle energies below 150 Mev, only elastic scattering is possible in $\Lambda - N$