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III–7 Magnetic Moment of the $8^+[(\nu g_{9/2})^{-2}]$ State in ^{86}Sr

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Recently Ishihara *et al.* found the 8^+ isomeric state in ^{86}Sr and determined its half life to be 0.46 ± 0.03 μsec.[1] The shell-model configuration of the state is $8^+[(\nu g_{9/2})^{-2}]$ where ^{88}Sr ($Z=38$, $N=50$) is assumed to be the core. The ^{88}Sr(p, p2n)^{86}Sr reaction at the bombarding energy of 51 MeV was used to populate the 8^+ state. The proton beam provided by the INS synchro-cyclotron was chopped by an electrostatic deflector to produce the pulsed beam of width ~100 nsec and interval ~20 μsec. The time differential pattern of the 627-keV gamma ray at $H=7.27$ kG was observed as shown in the Fig. 1. The g factor of the 8^+ state was determined to be

$$g(8^+: {}^{86}\mathrm{Sr}) = -0.241 \pm 0.015.$$

The main configuration of the ground state in ^{87}Sr is the one-hole state of the $g_{9/2}$ neutron. The g factor of this state is known to be $g=-0.2429$ by the NMR experiment.

In the single particle model the g factor of the two-hole state $(j^{-2})J$ is simply equal to the g factor of the one-hole state;

$$g(|j^{-2}\rangle) = g(|j^{-1}\rangle)$$

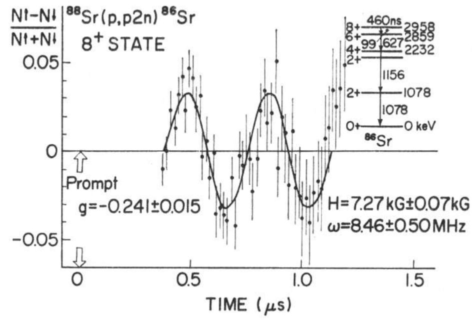

Fig. 1

The additivity between the g factor of the 8^+ state in ^{86}Sr and that of the $9/2^+$ state in ^{87}Sr holds rather well, though these g factors deviate from the Schmidt estimate of -0.425. The deviation $\delta g = g_{\mathrm{exp}} - g_{\mathrm{Schmidt}} = +0.18$ is nearly accounted for by the theory of Arima and Horie ($\delta g_{1\mathrm{st}} \sim +0.23$).[2]

References

1) M. Ishihara, H. Kawakami, N. Yoshikawa, M. Sakai and K. Ishii: Phys. Letters **35B** (1971) 398.
2) A. Arima and H. Horie: Progr. theor. Phys. (Kyoto) **12** (1954) 623.

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