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THE QUASI-BAND STRUCTURE IN ^{57}Co

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We have studied high spin states of ^{57}Co by in-beam γ -ray spectroscopy in the $^{48}\text{Ti}(^{12}\text{C}, p2n)$ and $^{54}\text{Fe}(\alpha, p)$ reactions. γ -ray single, coincidence spectra, excitation functions and angular distributions were measured. The preliminary result is shown in Fig. 1, where levels above 1.7 MeV are those established in this work.

The spin sequence of $7/2^-$, $9/2^-$, $11/2^-$ and $13/2^-$ were predicted by the shell-model calculation [1], in which ^{40}Ca was considered as an inert core and valence nucleons were distributed in the $f_{7/2}$, $p_{3/2}$, $p_{1/2}$ and $f_{5/2}$ orbits. The calculation based on the coupling of a proton hole to the quadrupole vibrations of the neighboring even-mass Ni nucleus [2] also explained states up to $11/2^-$. However, neither of these calculations predicts existence of levels with $J \geq 15/2$. It seems necessary, therefore, to calculate the level scheme due to the aligned coupling scheme [3], which has been successfully applied to the quasi-band structure of f-p shell nuclei consisting of three or four valence nucleons outside the core.

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[1] C. Gatrousis et al., Phys. Rev. **180** (1969) 1052.

[2] L. Satpathy et al., Nucl. Phys. **A110** (1968) 400.

[3] Y. Tanaka et al., Phys. Letters **56B** (1975) 309.

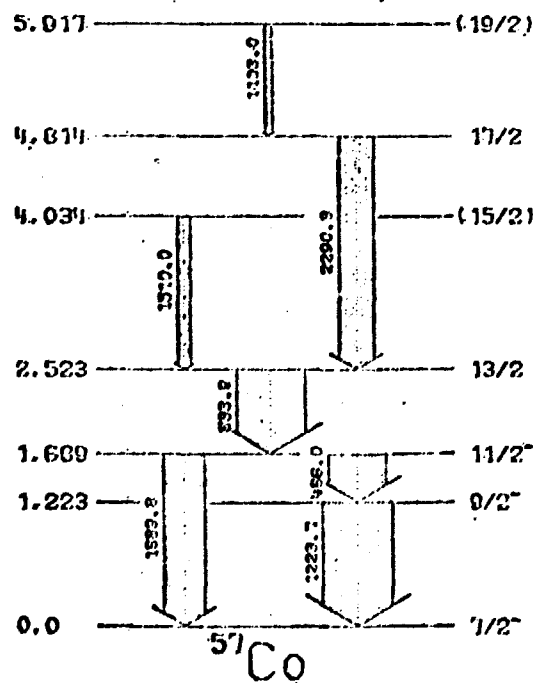


Fig. 1