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III–19 Magnetic Moments of $[(\pi h_{9/2})^2]8^+$ States in ^{206}Po and ^{204}Po

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The g-factors of the $[(\pi h_{9/2})^2]8^+$ states in the even isotopes ^{210}Po to ^{202}Po yield information about nuclear structure and effective single particle moments. Since these states differ in neutron number, the M1 core polarization due to neutrons is measurable. The g-factors of the 8^+ states in ^{210}Po and ^{208}Po have been determined by Yamazaki *et al.*.[1,2] We report measurements of the corresponding g-factors in ^{206}Po ($T_{1/2} = 212$ ns) and ^{204}Po($T_{1/2} = 140$ ns) following the reactions ^{204}Pb(α, 2n) and ^{204}Pb(α, 4n), respectively.

A 50 mg/cm^2 metallic foil of ^{204}Pb was bombarded with 28 MeV (or 48 MeV) α-particles from the Karlsruhe Cyclotron. The time interval between the beam bursts was 90 ns, which is shorter than the mean lives of interest. We therefore performed a spin rotation experiment with the condition that the repetition time of the beam is equal to about two times the period of the γ-intensity modulation. This procedure is very similar to the stroboscopic method with $n = 2$. Preliminary values for the g-factors are $g(^{206}\text{Po}, 8^+) = 0.95 \pm 0.04$ and $g(^{204}\text{Po}, 8^+) = 1.04 \pm 0.08$. The result for ^{206}Po still is compatible with the anomalous g-factors (all $g = 0.91$) of the corresponding states in ^{210}Po and ^{208}Po, and of the $h_{9/2}$ state in ^{209}Bi. To discuss the g-factors in more detail the accuracy of the measurements has to be improved.

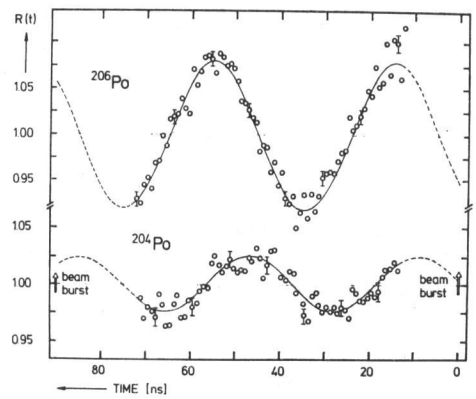

Fig. 1. Time differential spin rotation patterns of the 8^+ states of ^{206}Po (upper part) and ^{204}Po (lower part). The 395 keV γ-rays of ^{206}Po and the 427 keV γ-rays of ^{204}Po were observed in a magnetic field of 15.9 kG.

References

1) T. Yamazaki *et al.*: Phys. Rev. Letters **24** (1970) 317.
2) S. Nagamiya *et al.*: Nuclear Phys. **A159** (1970) 653.