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III–9 *g*-Factor Measurement of the 2953-keV State in ^{94}Mo

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The nuclear g-factor of the $8^{\pm}$ state at 2953 keV in ^{94}Mo has been determined by use of time-differential PAC techniques. The goal of the experiment was to compare the g-factor of this state, which is expected to be $(\pi g_{9/2}^2, \nu d_{5/2}^2)\ 8^+$, with those of similar configurations in neighboring nuclei, *i.e.*, ^{93}Nb $(\pi g_{9/2}, \nu d_{5/2}^2)\ 9/2^+$ and ^{92}Mo $(\pi g_{9/2}^2)\ 8^+$. This state in ^{94}Mo was populated with a pulsed 24-MeV α beam by the ^{92}Zr (α, 2n) ^{94}Mo reaction. The target was an enriched ^{92}Zr foil of $\simeq$1.0 mg/cm^2. The PAC measurements were made at $\pm 45°$ with NaI(Tl) detectors. The delayed portion of the three cascade γ transitions deexciting the 6_1^+, 4_1^+, and 2_1^+ states (E_γ = 843, 702, and 870 keV, respectively) were used for the timing measurements. A 40 cm^3 Ge(Li) detector at 90° lead to identical results but with less statistics. From the Larmor frequency measured with an external field of 15.85 kG, a g-factor of $g = +1.317 \pm 0.020$ has been deduced for the 2953-keV level in ^{94}Mo; the data and the least squares fit are presented in the figure. In addition, a more precise lifetime of $\tau = 141 \pm 3$ nsec has been extracted from the data for this level. The present g-factor result shows a slight reduction in comparison to the g-factor for the above mentioned $9/2_1^+$ state in ^{93}Nb of $g = 1.3707$ and that of the 8_1^+ state in ^{92}Mo of $g = 1.409$.

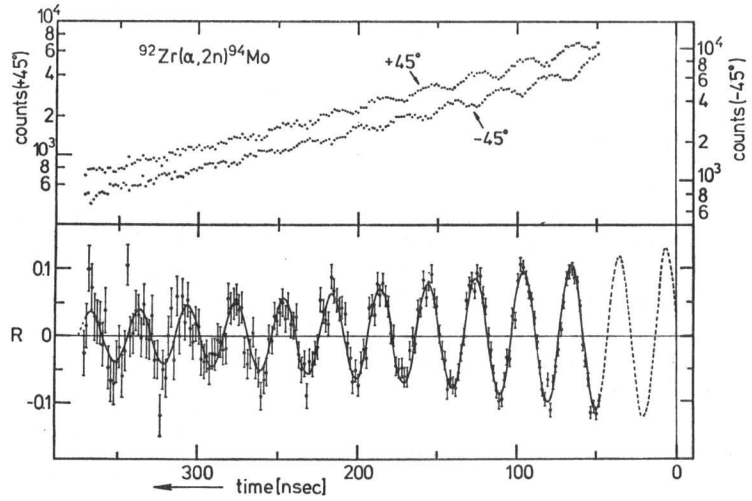

Fig. 1.