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Lifetime and g -Factor of the 1065-keV ($15/2^-$) State in ^{211}Po

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Preliminary measurements for the lifetime and the g -factor of the 1065-keV state in ^{211}Po have been obtained. The state was populated by the $^{208}\text{Pb}(\alpha, n)$ reaction with a 22.5-MeV pulsed α beam. The time spectrum observed for the 1065-keV γ ray with a Ge (Li) detector (see Fig. 1) was entirely delayed implying that the associated lifetime is due to the 1065-keV state. A mean life of $\tau = 23 \pm 2$ nsec was extracted from the slope measurements of both Ge(Li) and NaI detectors. A g -factor of $g = -0.05 \pm 0.02$ was obtained after appropriate beam bending corrections, from integral measurements with two Ge(Li) detectors and a field of 16.6 kG. The observed lifetime and positive A_2 are consistent with a $15/2^- \rightarrow 9/2^+$ enhanced E3 transition of 18 WU. In addition the energy and lifetime of this level are in agreement with recent calculations for a $15/2^-$ state by J. Blomqvist. Assuming a wave function of $\psi = \{a(vj_{15/2}) + (1 - a^2)^{1/2}(3^- \otimes vg_{9/2})\} 15/2^-$ with the $h_{9/2}^2$ protons coupled to $J = 0$, the measured g -factor implies an amplitude of $a = 0.7$ using empirical g -factors and the $vj_{15/2}$ Schmidt value corrected for core polarization. Upon achieving a better understanding of the wave function for this state, the $vj_{15/2}$ g -factor can be extracted from the present result.

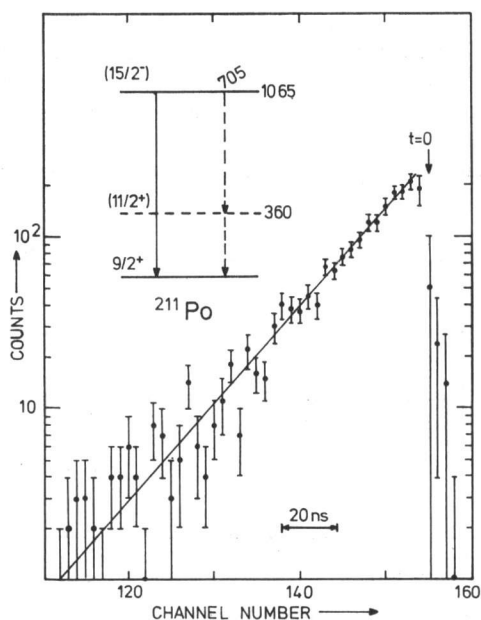


Fig. 1. The time spectrum for the 1065-keV γ ray. A proposed decay scheme of this isomer is also shown.