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In this note the results of a remeasurement of the hyperfine magnetic field at ^{67}Ge in an iron host are reported. Morgenstern et al.[1] using alloys of about 5 atomic percent Ga in Fe, in an external magnetic field of a few kG, obtained a value of H_{hf}(Fe) = +70.0 ± 3.0 kG. The charge-exchange ^{71}Ga(p,n)^{71}Ge reaction was used to populate the 175-keV ($J^{\pi} = 5/2^-$; $T_{1/2}$ = 79.0 ± 2.0 ns) level. Raghavan et al.[2] report a value of 60 ± 2 kG for the hyperfine field at ^{67}Ge in Fe. An enriched 1mg/cm^2 ^{54}Fe foil clamped together with a polycrystalline foil of Fe was used as the target, and an external magnetic field of about 1.7 kOe was applied perpendicular to the reaction plane. The reaction used to produce ^{67}Ge was ^{54}Fe(^{16}O, 2pn).

In the present work the ^{67}Ge nuclei were produced by means of the ^{56}Fe(^{14}N,2np) reaction at E_{lab} = 45 MeV, using as a target a 0.5 mil thick natural Fe foil, in the gap of a C-magnet which produced a field of about 300 gauss to saturate the foil.For this geometry the demagnetising field is negligible. The ^{14}N beam was pulsed with a repetition period of 400 ns. The 734 keV γ-ray in the 751.7 to 18.7 -keV transition[3] was observed with two NaI(Tl) detectors placed at ±45° to the beam direction. The delayed time spectrum of the γ-rays was measured with a time-to-amplitude converter and standard fast-slow electronics with a time resolution of ∿ 8 ns. The half-life of the 751.7 -keV level was found to be 70 ± 2 ns in agreement with the previously known value[4]. The ratio R(t) obtained with the normalized difference in counting rates for the two field directions was fitted to the function $A \sin 2\omega_L t$ and is shown in figure 1. From the measured Larmor frequency ω_L and the known g-factor of -0.945 ± 0.030[4], a value of 61.4 ± 2 kG is obtained for the hyperfine field at ^{67}Ge in Fe in agreement with the value of Raghavan et al.[2]. A random field measurement inspite of poor statistics gave the same value.

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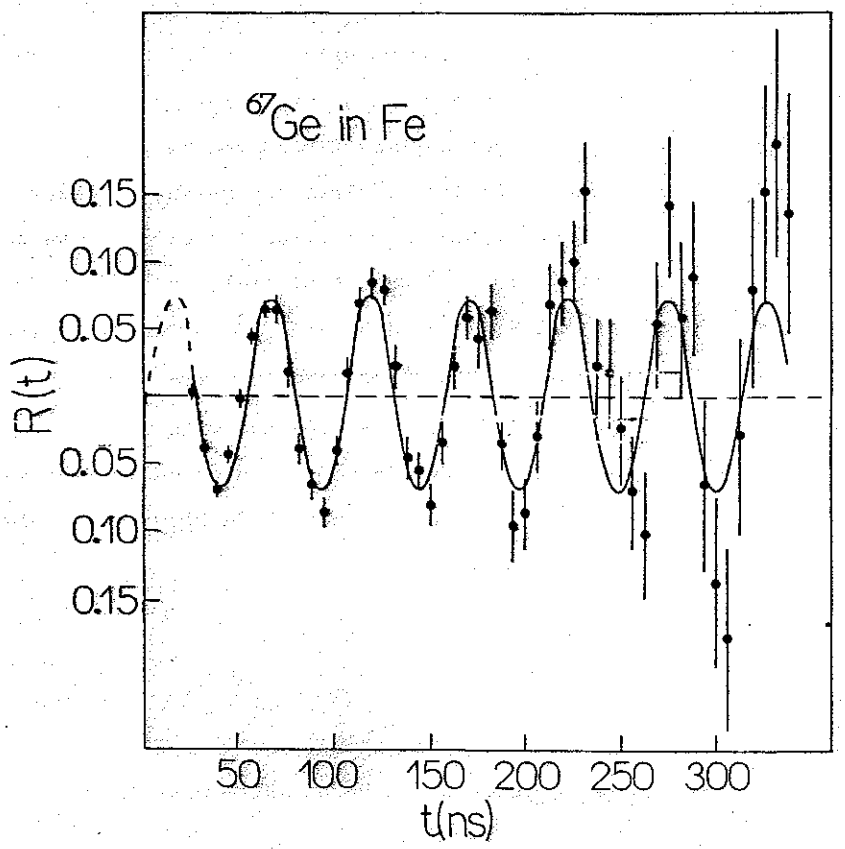
^{67}Ge in Fe
0.15
0.10
0.05
R(t)
0.05
0.10
0.15
50
100
150
200
250
300
t(ns)