

SEKTIE B

B1

TRANSIENT MAGNETIC FIELDS AT HIGH VELOCITY

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The spin precession of the very short lived (60 fs) 4.43 MeV level of ^{12}C has been measured with the transient magnetic field in Fe at a recoil velocity of $v/c = 0.03$. The measurement yields an integral precession angle of $\Delta\theta = 0.49 \pm 0.11$ mrad, which is almost a factor of two smaller than the result of a recent experiment in Strasbourg ¹⁾. The present value can be explained by polarized electron capture ²⁾ in the 1s shell of the C-ion.

The observed linear velocity dependence of the transient field for e.g. ^{28}Si [ref.2)] can well be explained by capture of polarized electrons into 2s or 1s shell vacancies of the moving ion. As was recently pointed out by Brandt ³⁾, however, the velocity dependence can also be explained by the inclusion of higher-order effects in the calculation of the enhancement of the electron density at the moving nuclear charge.

- 1) M.B. Goldberg et al., to be published in Hyperfine Interactions
- 2) J.L. Eberhardt et al., to be published in Hyperfine Interactions
- 3) W. Brandt (New York), Haifa International Workshop on atomic and nuclear physics, August 1976.

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THE RECOMMENDED UPPER LIMIT FOR ISOSPIN RETARDED M1 TRANSITIONS

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From the measured strengths of 30 isospin retarded (isoscalar) M1 ($M1_{IS}$) transitions between bound states in nuclei in the $A < 45$ region a recommended upper limit (RUL) of 30 mW.u. has been derived ¹⁾.

Recently, the lifetime of the 5.69 MeV level in ^{14}N has been measured as 10 ± 2 fs ²⁾, which together with the branching of $(3.7 \pm 1.4)\%$ ³⁾ for the $5.69 \rightarrow 5.11$ MeV transition would yield an $M1_{IS}$ strength of 600 ± 250 mW.u., exceeding the RUL value by a factor of 20.

The branching of the 5.69 MeV level has been remeasured by means of the $^{13}\text{C}(p,\gamma)^{14}\text{N}$ reaction ($E_p = 551$ keV). From singles γ -ray spectra taken with 80 and 100 cm³ Ge(Li) detectors and with a Compton suppression spectrometer an upper limit of 0.5 % can be deduced for the $5.69 \rightarrow 5.11$ MeV branch.

- 1) P.M. Endt and C. van der Leun, Nucl. Phys. A235 (1974) 27
- 2) C. Ruiz, D.A. Sink and R.W. Krone, Bull. Am. Phys. Soc. 19 (1974) 432
- 3) M.J. Renan, J.P.F. Sellschop, R.J. Keddy and D.W. Mingay, Nucl. Phys. A193 (1972) 470