REVIEWS OF
MODERN PHYSICS

VOLUME 45, NUMBER 4 OCTOBER 1973

Impact Excitation and Polarization of the Emitted Light*

U. Fano

Department of Physics, The University of Chicago, Chicago, Illinois 60637

Joseph H. Macek

The collision frame loses its axial symmetry when the scattering direction (or a recoil direction) $\hat{z}'$ is observed in coincidence with the light emission. In beam foil excitation, the state of an atom emerging from the foil depends presumably on its interaction with the surface layers of the foil and hence on the orientation of this surface; therefore one can spoil the axial symmetry by tilting the normal to the foil, $\hat{z}'$, away from the beam axis $\hat{z}$.

When an axis $\hat{z}' \neq \hat{z}$ is thus singled out we may lay the $\hat{x}$ axis in the plane $(\hat{z}\hat{z}')$ and the collision identifies the axial vector $\hat{z} \times \hat{z}'$ parallel to $\hat{y}$. The *orientation* parameter $O_{1-}^{\mathrm{col}} \propto \langle (i' \mid J_y \mid i) \rangle$ is now generally *nonzero*

PHYSICAL REVIEW
LETTERS

VOLUME 32 | 8 APRIL 1974 | NUMBER 14

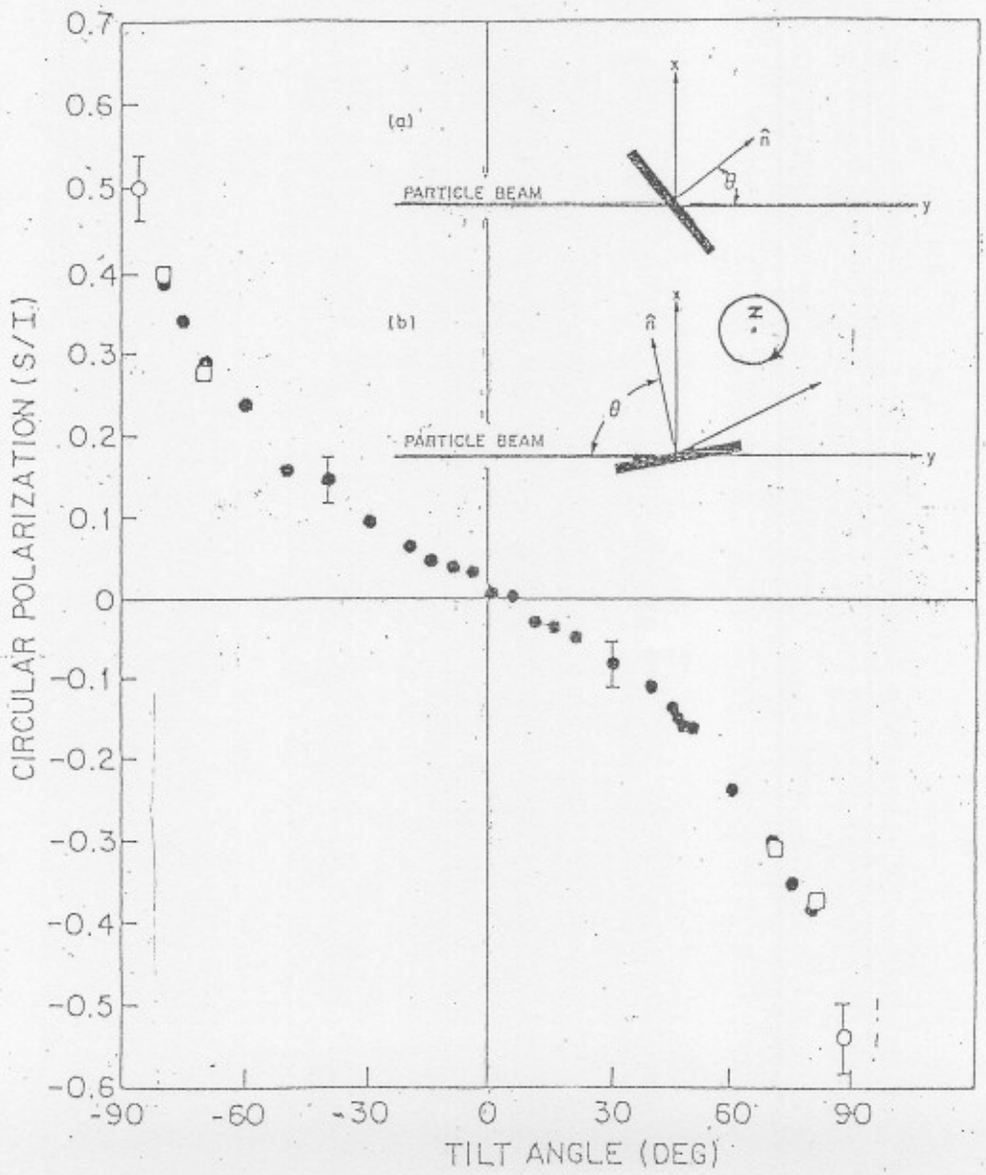
Anisotropy in the Beam-Foil Light Source

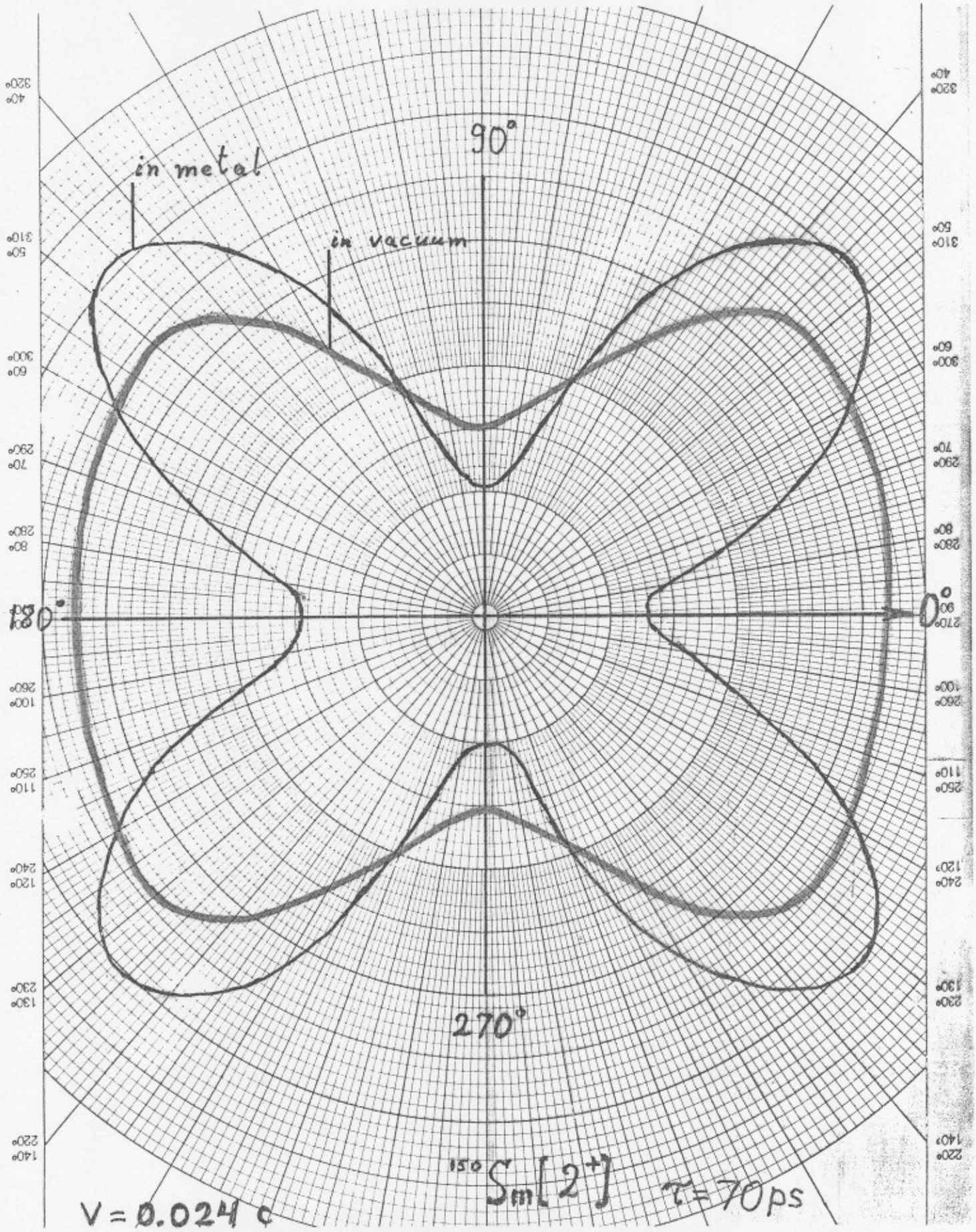
H. G. Berry
Department of Physics, University of Chicago, Chicago, Illinois 60637

and

L. J. Curtis, D. G. Ellis, and R. M. Schectman
Department of Physics and Astronomy, University of Toledo, Toledo, Ohio 43606
(Received 4 February 1974)

large polarisation!



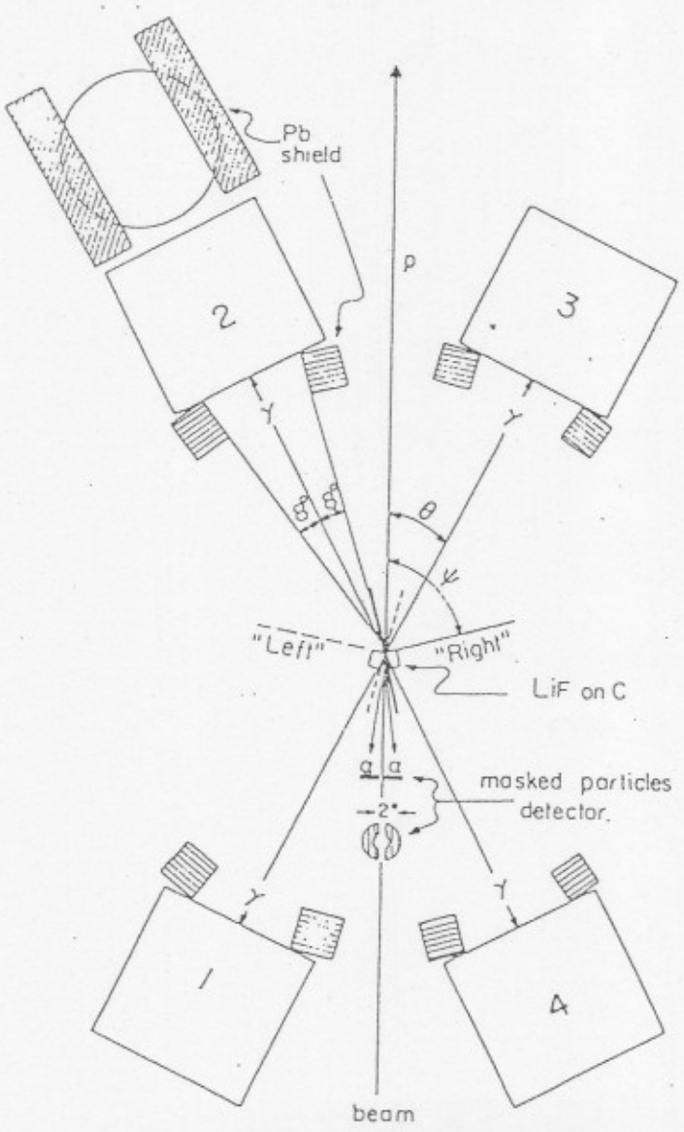

90°
in metal
in vacuum
180°
0°
270°
$^{150}Sm[2^+]$ τ=70ps
V=0.024 c

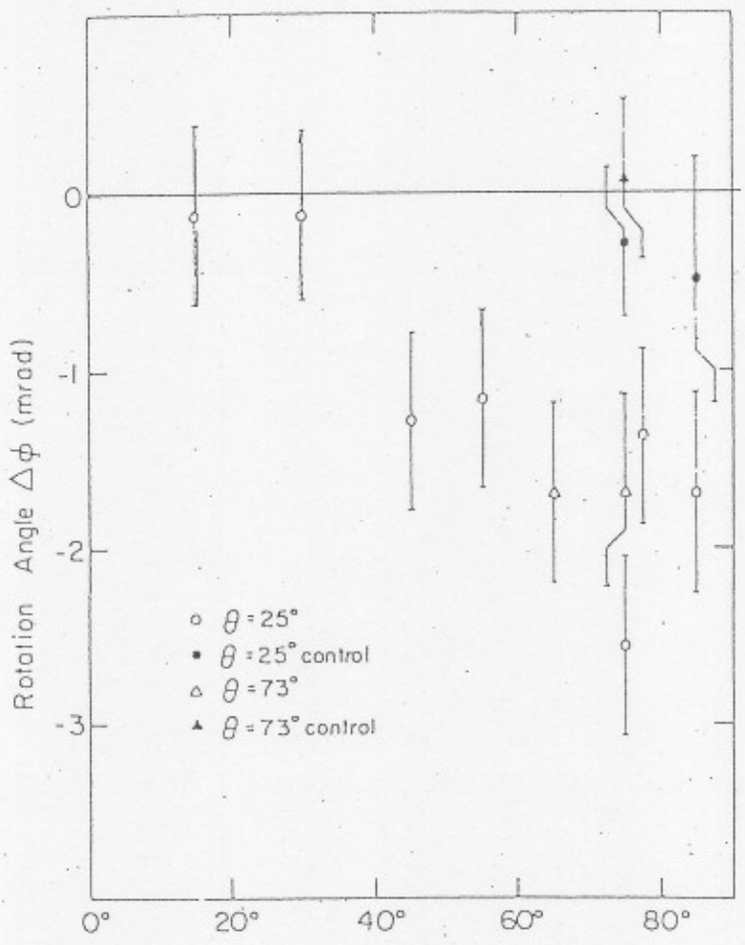
Magnetic Hyperfine Rotation of a γ-Ray Angular Distribution Due to Target Tilting*

G. Goldring, Y. Niv, Y. Wolfson, and A. Zemel
The Weizmann Institute of Science, Department of Nuclear Physics, Rehovot, Israel
(Received 6 December 1976)

$^{19}F(p,\alpha\gamma)^{16}O[3^-]$ $\tau = 25$ ps $g = 0.55$

$v(^{16}O) = 0.011c$




Rotation Angle Δφ (mrad)
0
-1
-2
-3
0°
20°
40°
60°
80°
θ = 25°
θ = 25° control
θ = 73°
θ = 73° control

Evidence for Surface-Interaction Effects via a Nuclear Hyperfine-Interaction Experiment

M. Hass,* J. M. Brennan, H. T. King, and T. K. Saylor
Department of Physics, Rutgers University, New Brunswick, New Jersey 08903†

and

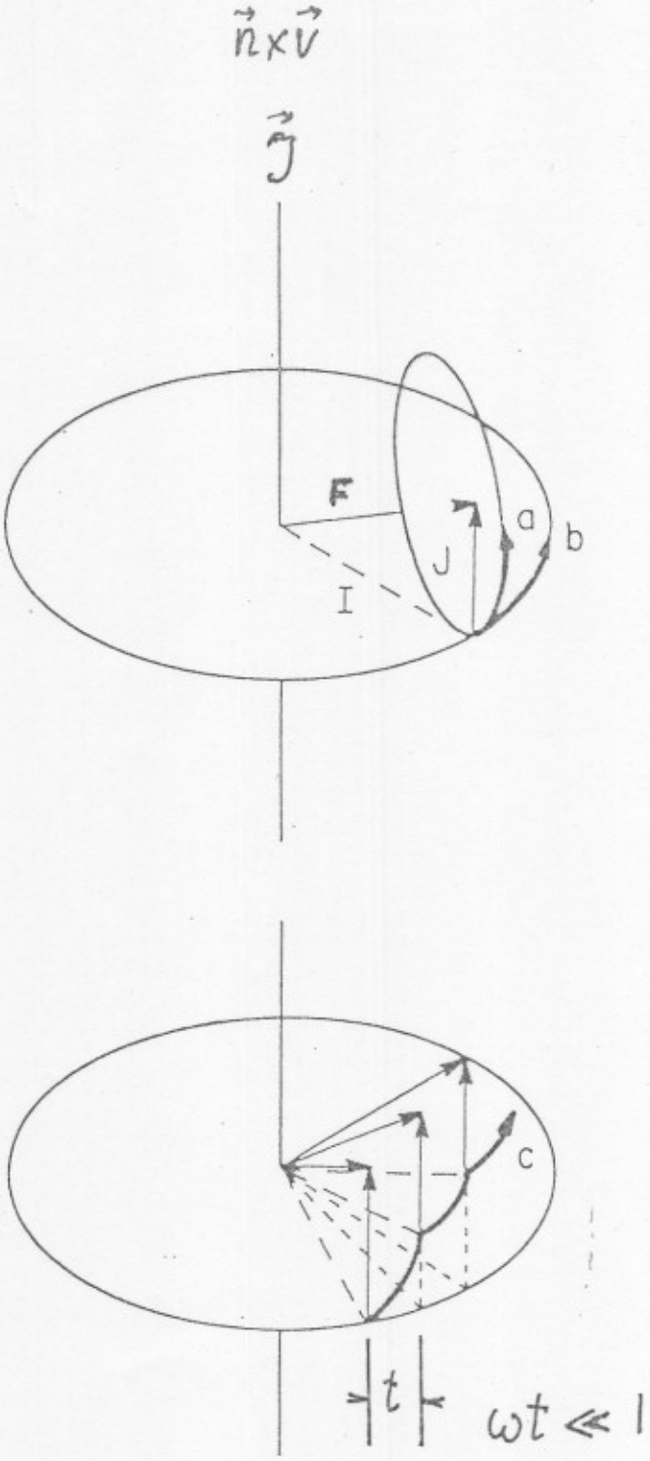
R. Kalish‡
Rutgers University, New Brunswick, New Jersey 08903, and Bell Laboratories, Murray Hill, New Jersey 07974
(Received 20 December 1976)

$^{18}O(\alpha,\alpha')^{18}O[2^+]$ $\tau = 3.6\,ps$ $g = -0.3$

$\Delta\varphi = +1.8(8)$ mrad

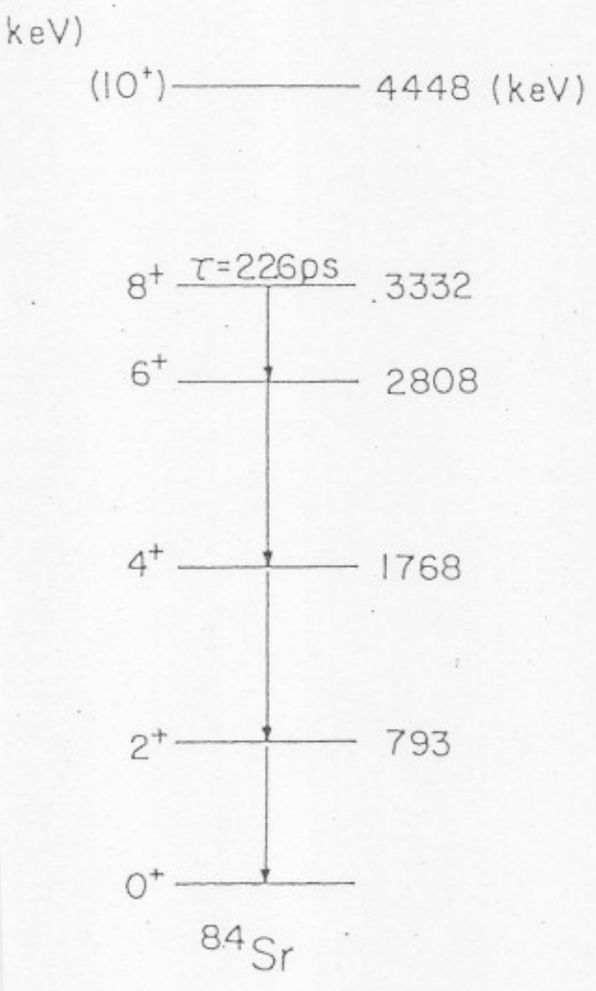
precession around F

tends to precession around $\vec{n}\times\vec{v}$ with field $\langle p_J H_0 \rangle$



THE g-FACTOR OF THE 8^+ YRAST LEVEL IN ^{84}Sr VIA A TILTED MULTI-FOIL EXPERIMENT ☆

C. BROUDE, E. DAFNI, A. GELBERG[1], M.B. GOLDBERG, G. GOLDRING,
M. HASS, O.C. KISTNER[2] and A. ZEMEL
Department of Nuclear Physics, Weizmann Institute of Science, Rehovot, Israel



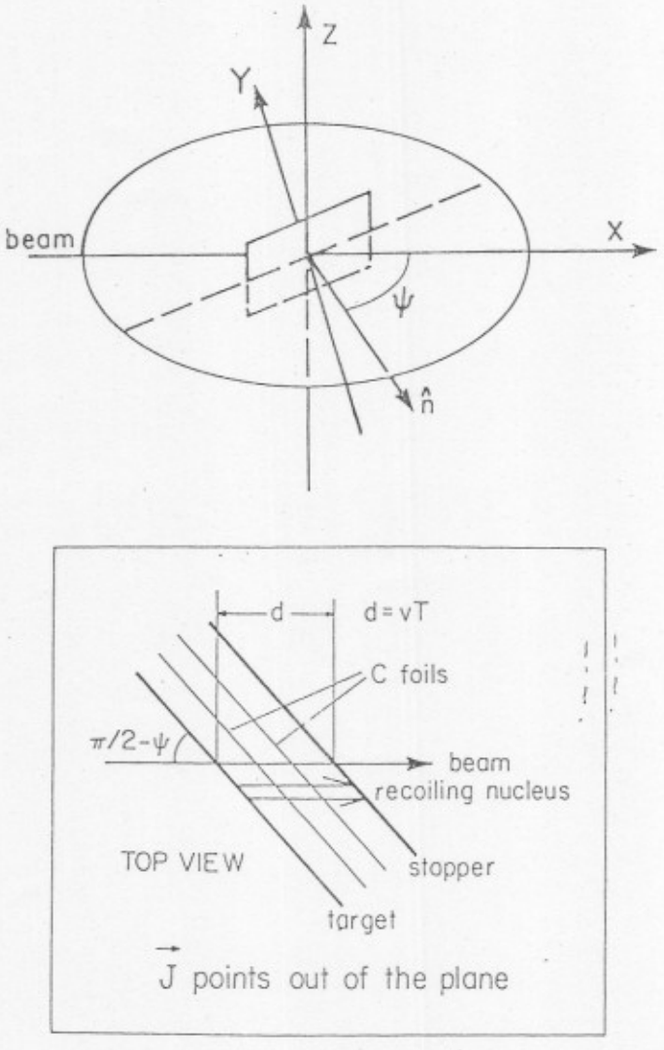
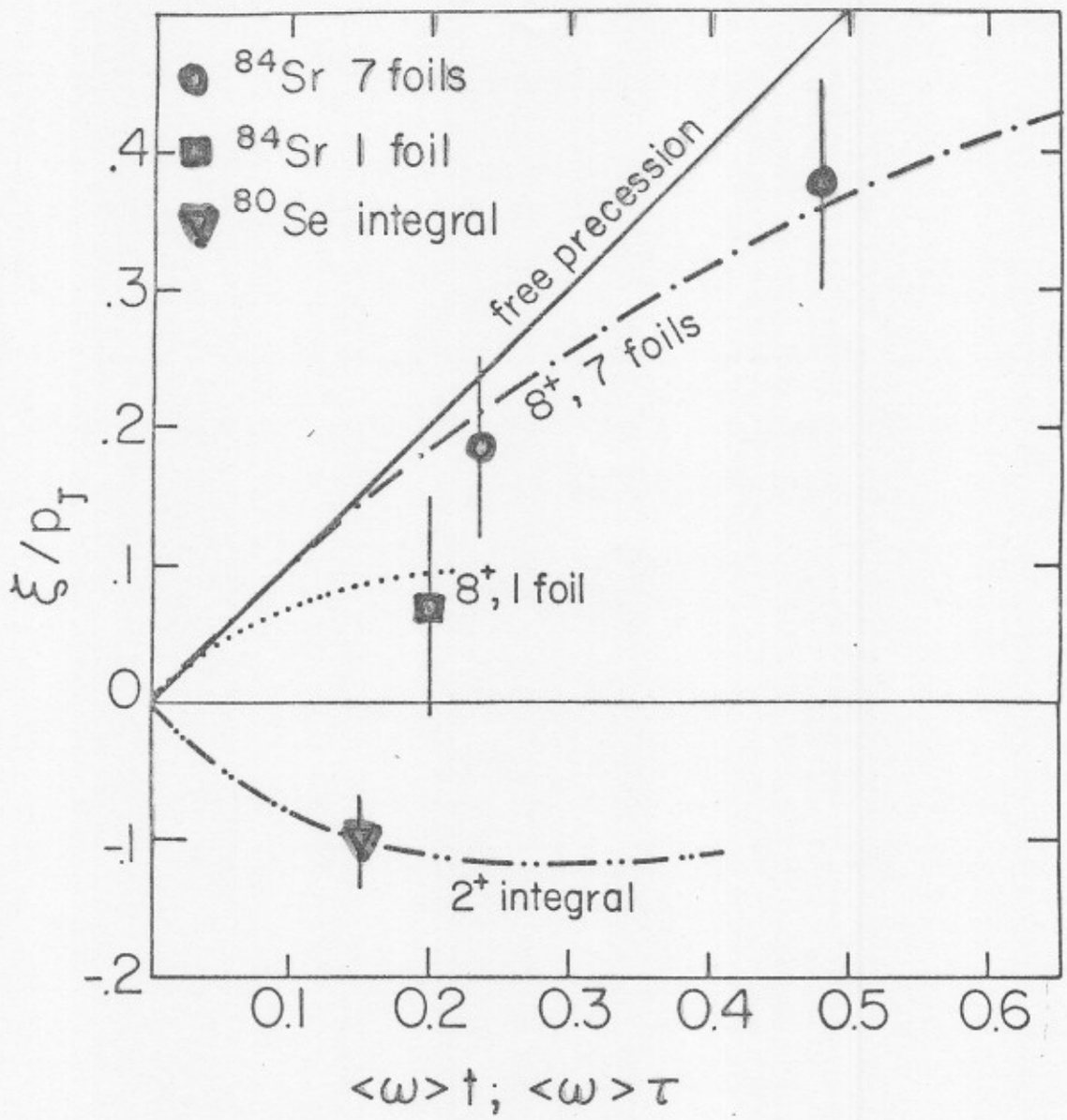


Fig. 3. Schematic view of the tilted-foil arrangement. The top figure presents the coordinate system with ψ being the angle between the beam direction and the normal $\hat{n}$ to the target plane. The bottom figure shows the target, stopper and carbon foils. The direction of polarization is along the z-axis.



$^{84}Sr[8^+]$

$g = -.15(7)$

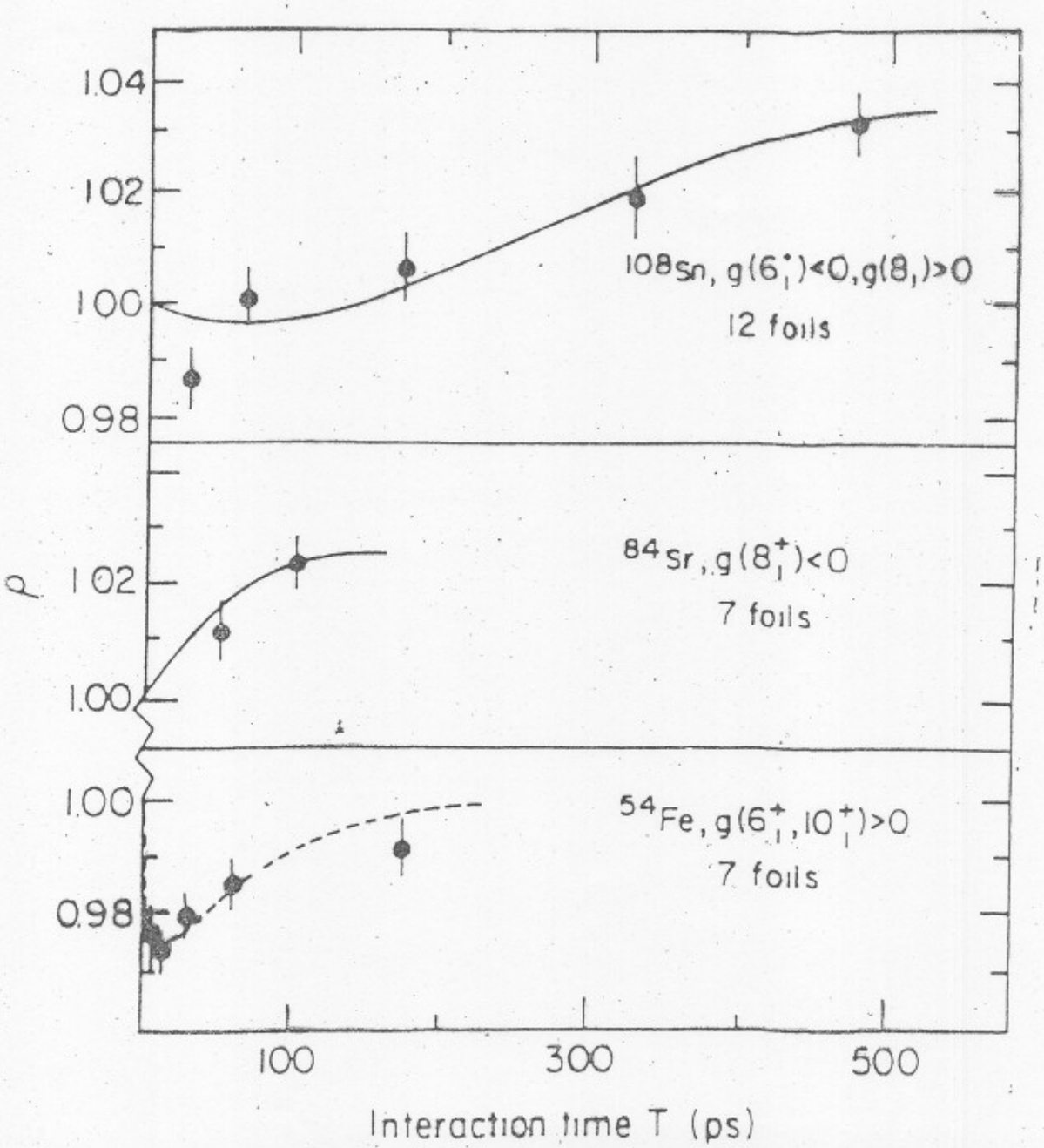
$p = .10(2)$

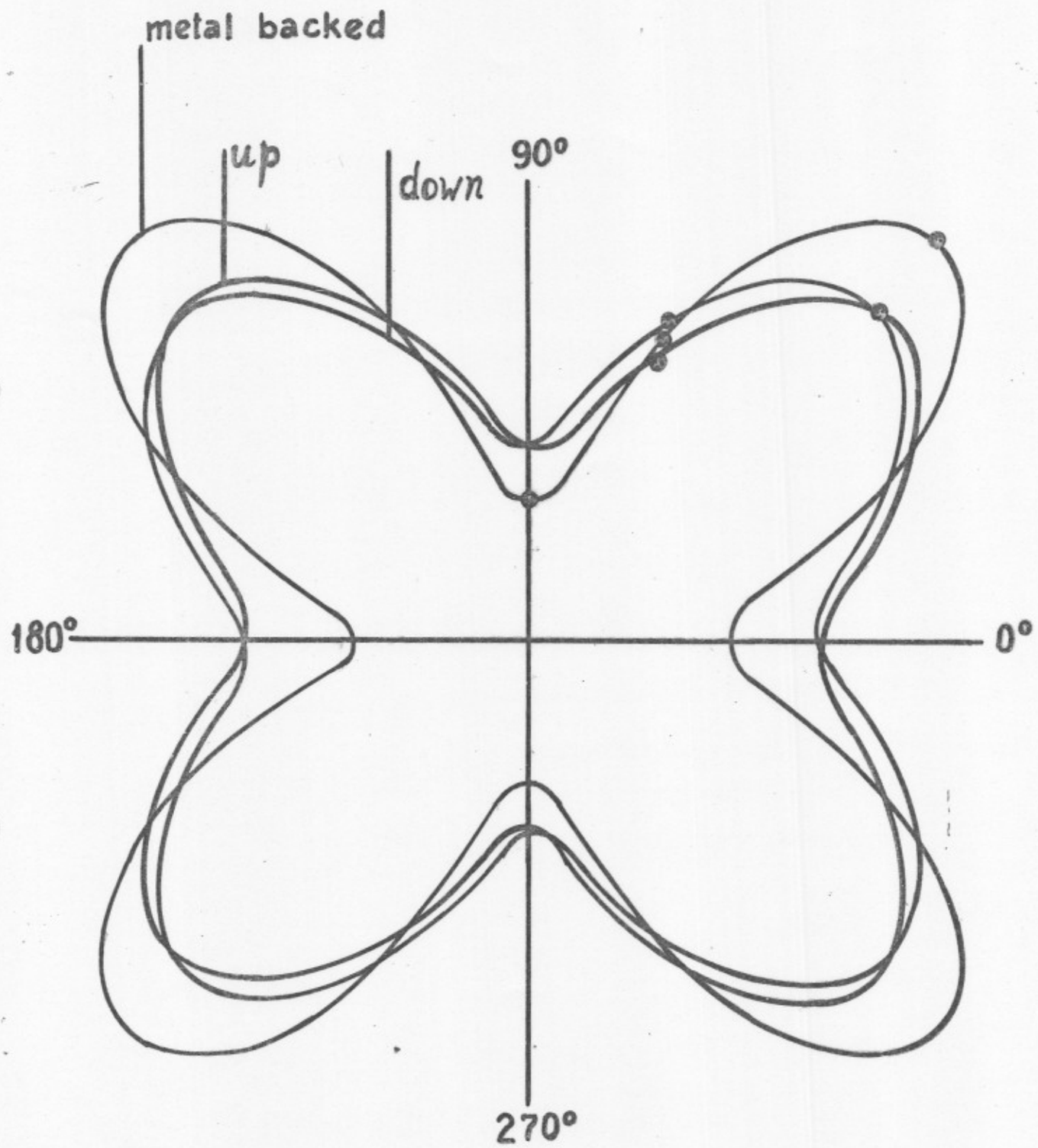
MEAN LIVES AND MAGNETIC MOMENTS OF HIGH-SPIN LEVELS IN ^{108}Sn*

M. HASS, H. H. BERTSCHAT†, C. BROUDE, E. DAFNI††, F. D. DAVIDOVSKY, G. GOLDRING and P. M. S. LESSER†††

Department of Nuclear Physics, Weizmann Institute of Science, Rehovot, Israel

$g[8_1^+] = +0.04(2)$

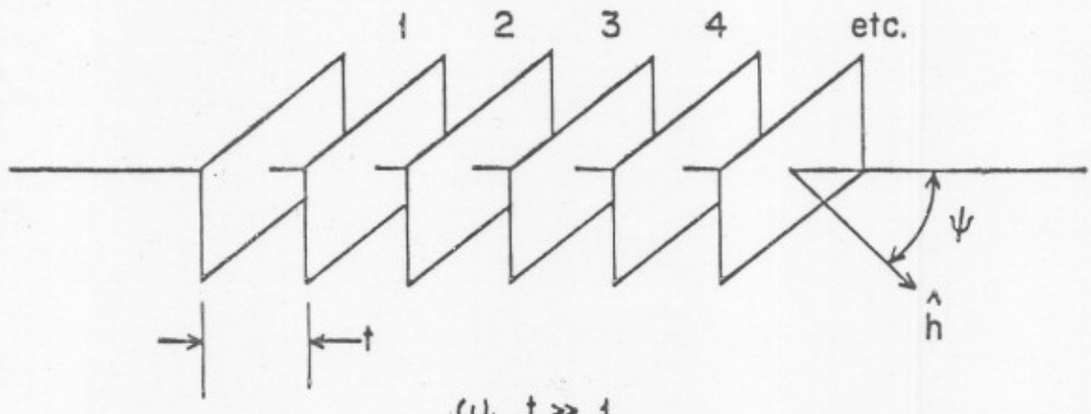




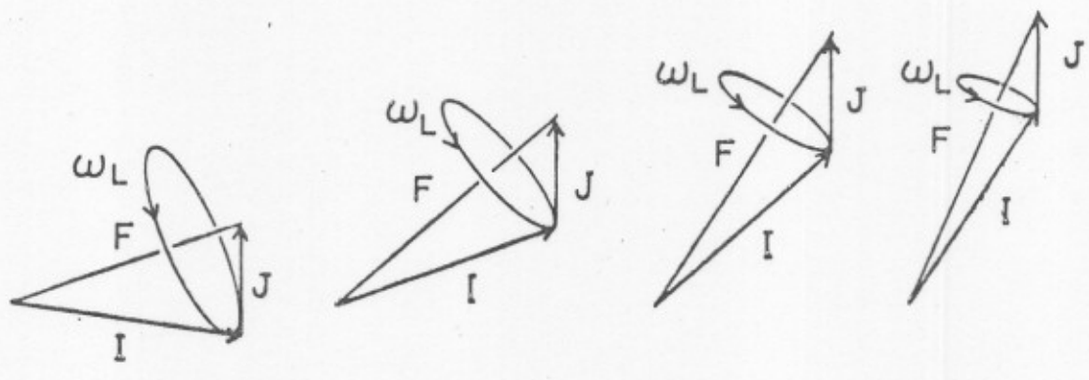
$^{150}Sm[2^+]$ v=0.024c t=13ps

10 C foils

(C)



$\omega_L t \gg 1$



nuclear polarization

NUCLEAR POLARIZATION AND SIGNS OF QUADRUPOLE MOMENTS OF HIGH-SPIN Gd ISOMERS†

E. DAFNI*, J. BENDAHAN, C. BROUDE, G. GOLDRING, M. HASS, E. NAIM and M.H. RAFAILOVICH

Department of Nuclear Physics, Weizmann Institute of Science, Rehovot, Israel

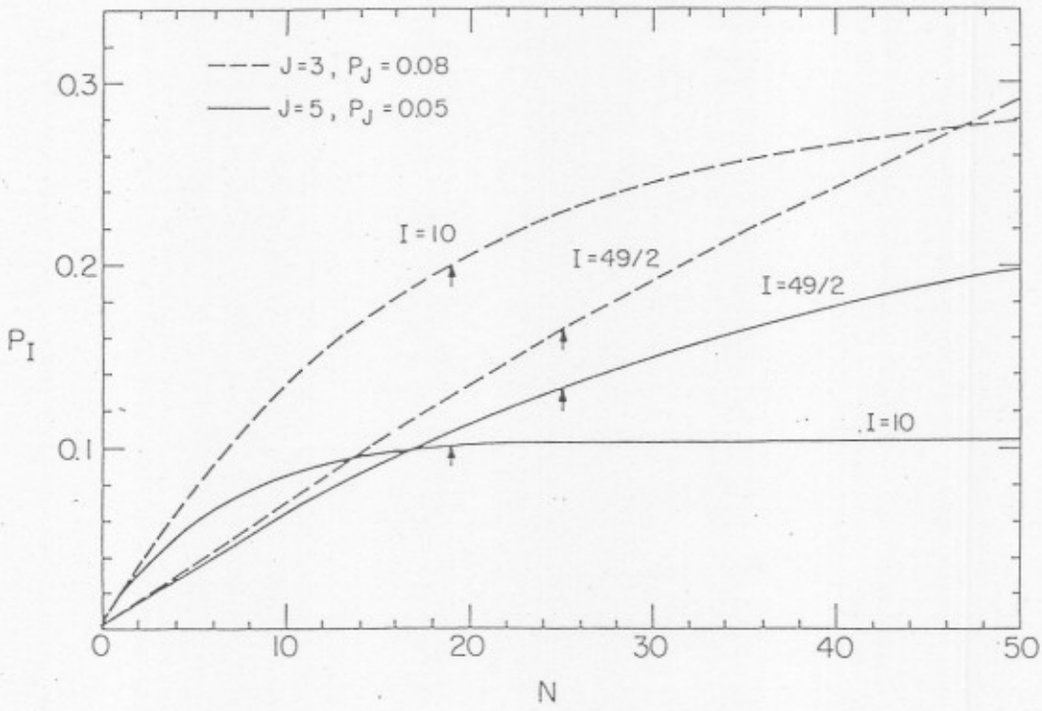
C. CHASMAN and O.C. KISTNER

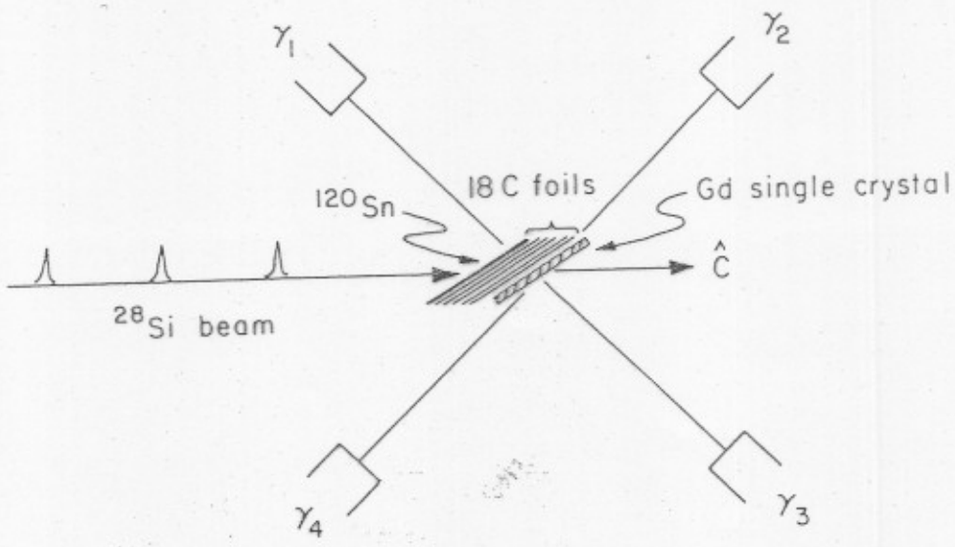
Department of Physics, BNL, Upton, NY, USA

and

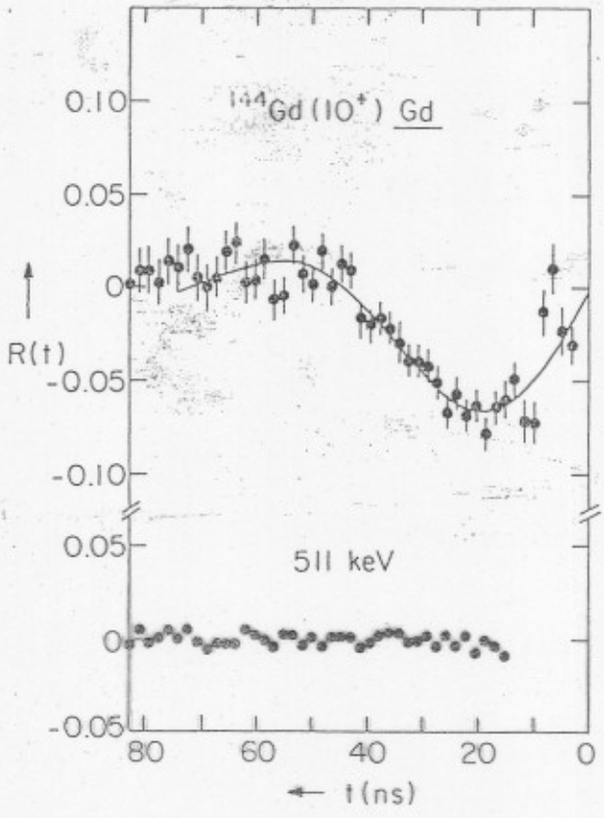
S. VAJDA**

Department of Physics, Rutgers University, New Brunswick, NJ, USA





polarization

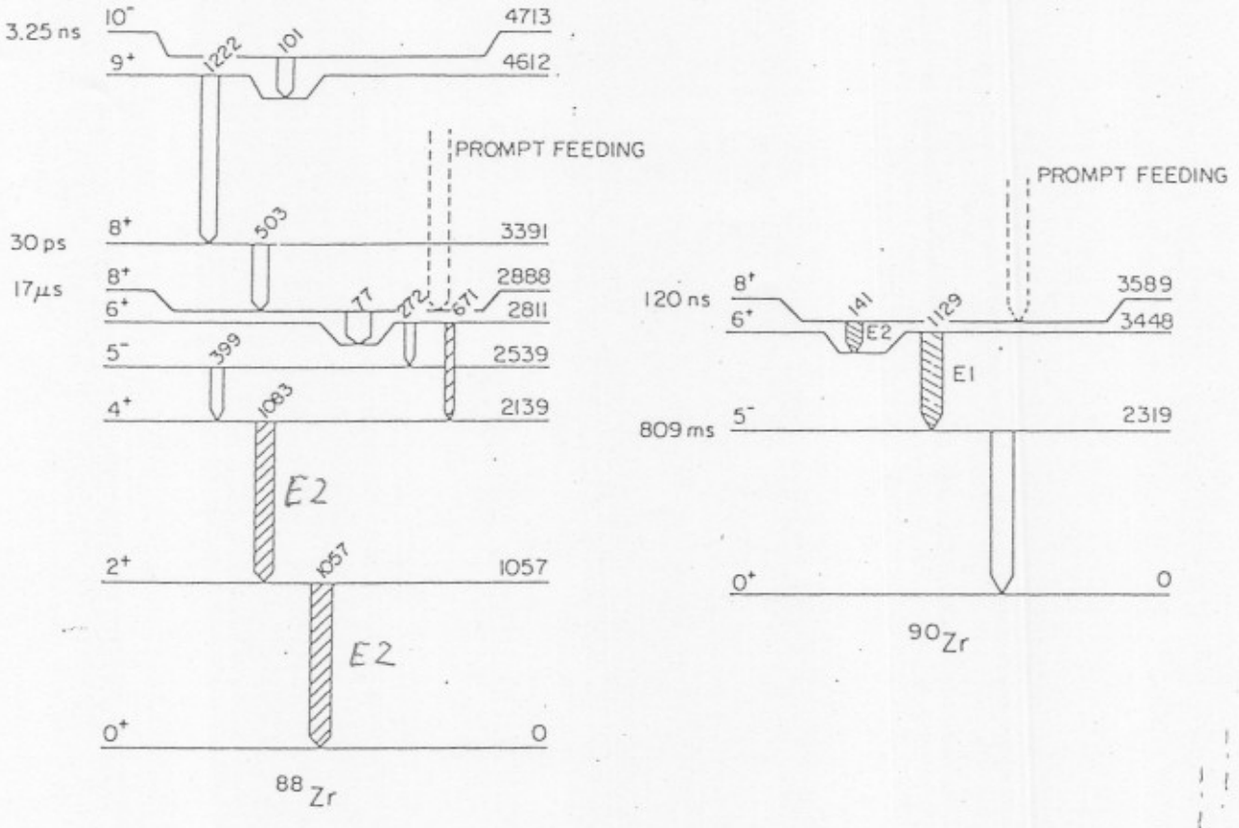


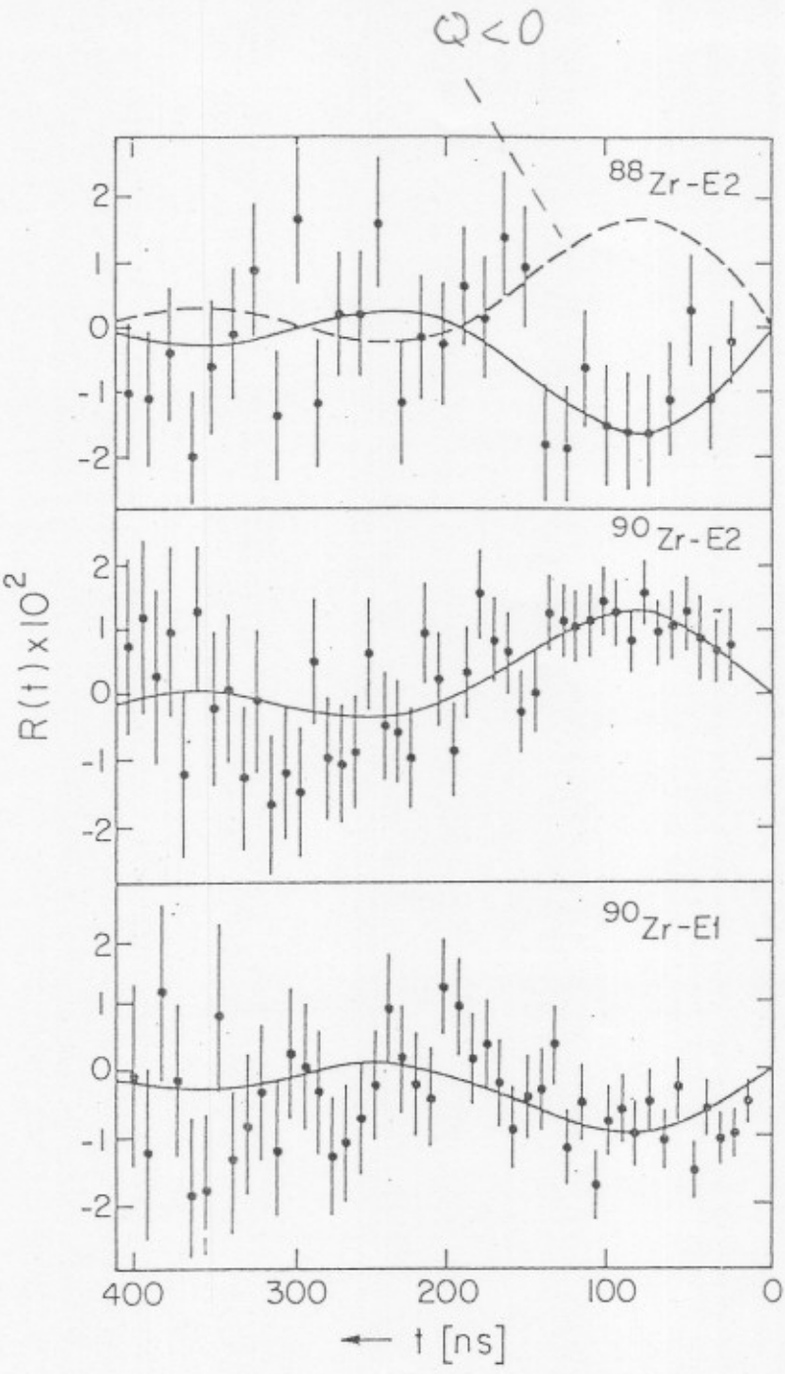
Q<0

M1

Signs of the quadrupole moments of the 8^+ isomers in $^{88,90}Zr$

J. Bendahan, C. Broude, E. Dafni, G. Goldring, M. Hass, E. Naim, and M. H. Rafailovich
Department of Nuclear Physics, Weizmann Institute of Science, Rehovot 76100, Israel
(Received 21 November 1985)





Q>0

Q<0

NUCLEAR POLARIZATION AND SIGNS OF QUADRUPOLE MOMENTS OF HIGH-SPIN Gd ISOMERS†

E. DAFNI*, J. BENDAHAN, C. BROUDE, G. GOLDRING, M. HASS, E. NAIM and M.H. RAFAILOVICH

Department of Nuclear Physics, Weizmann Institute of Science, Rehovot, Israel

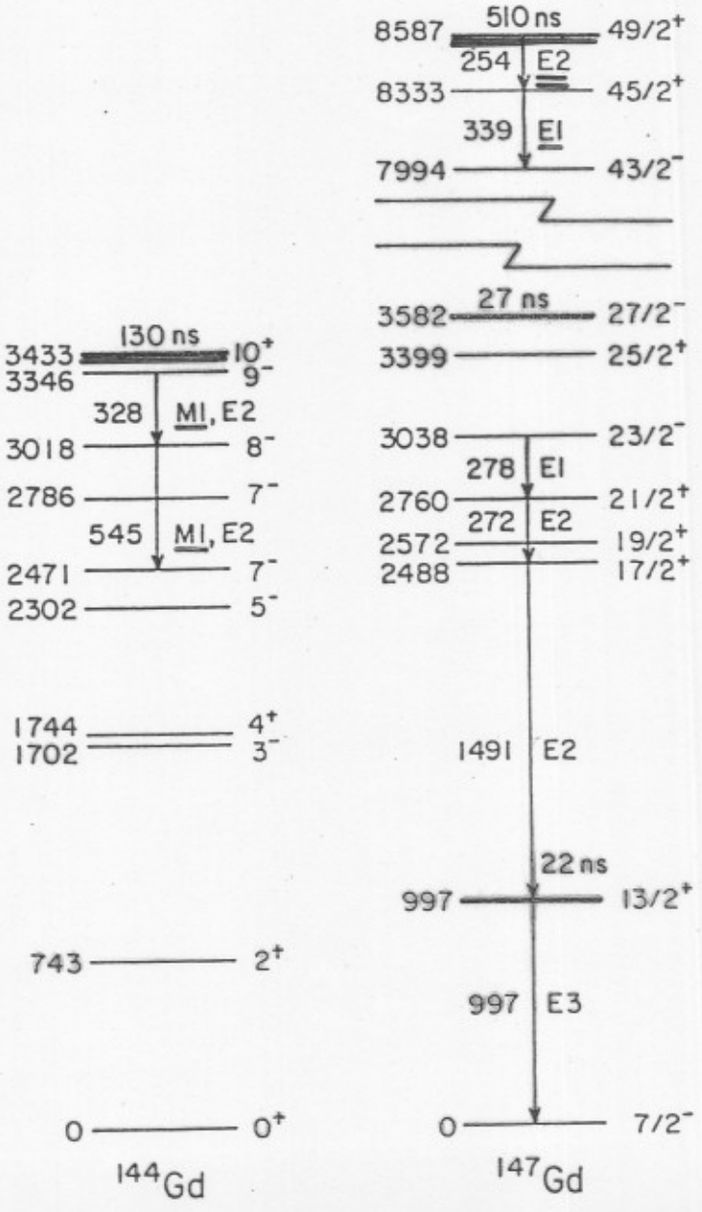
C. CHASMAN and O.C. KISTNER

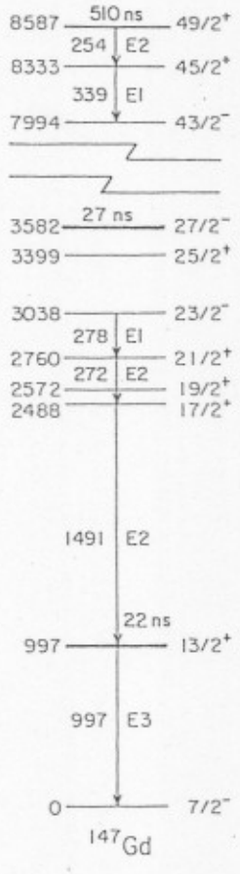
Department of Physics, BNL, Upton, NY, USA

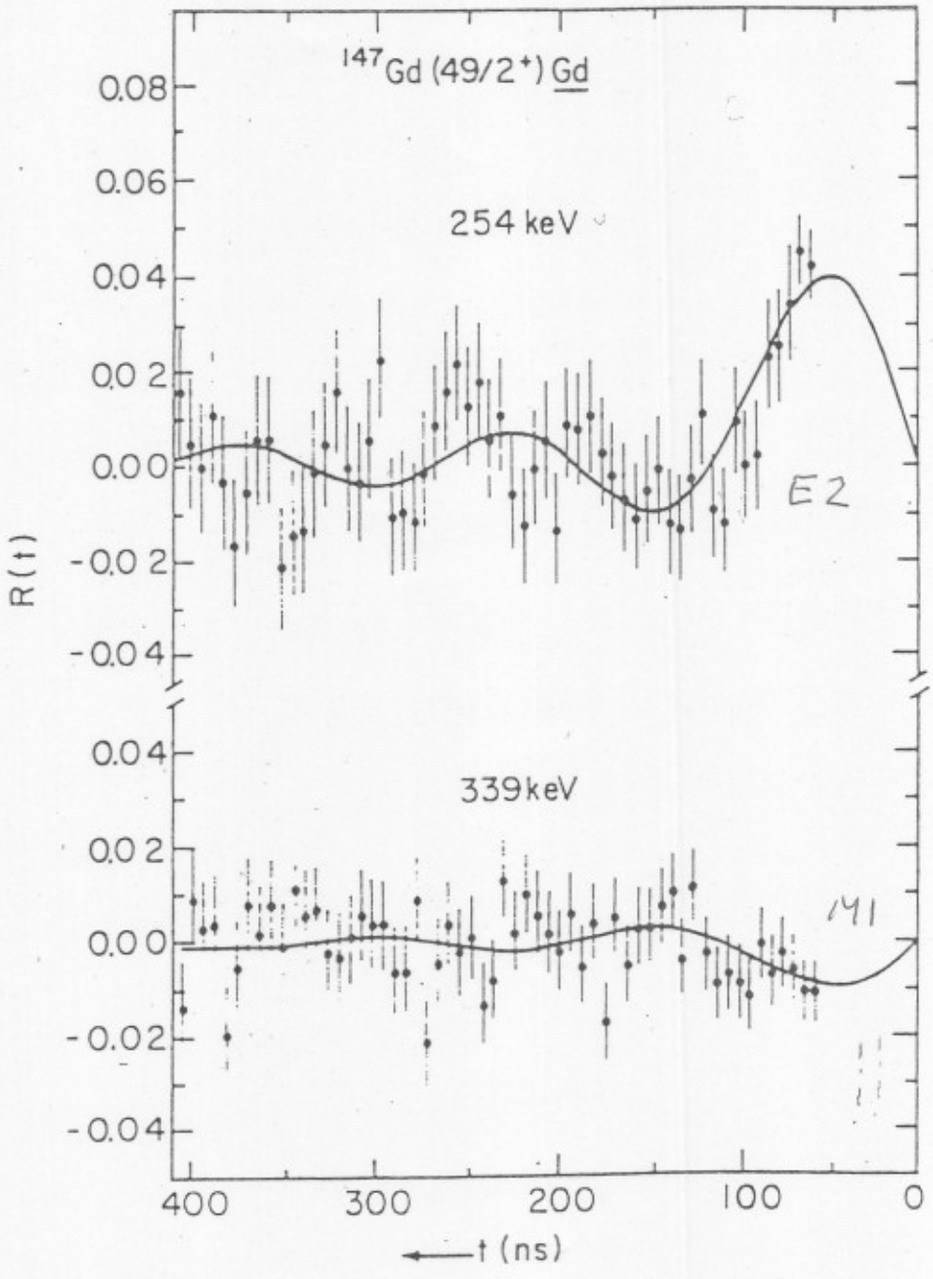
and

S. VAJDA**

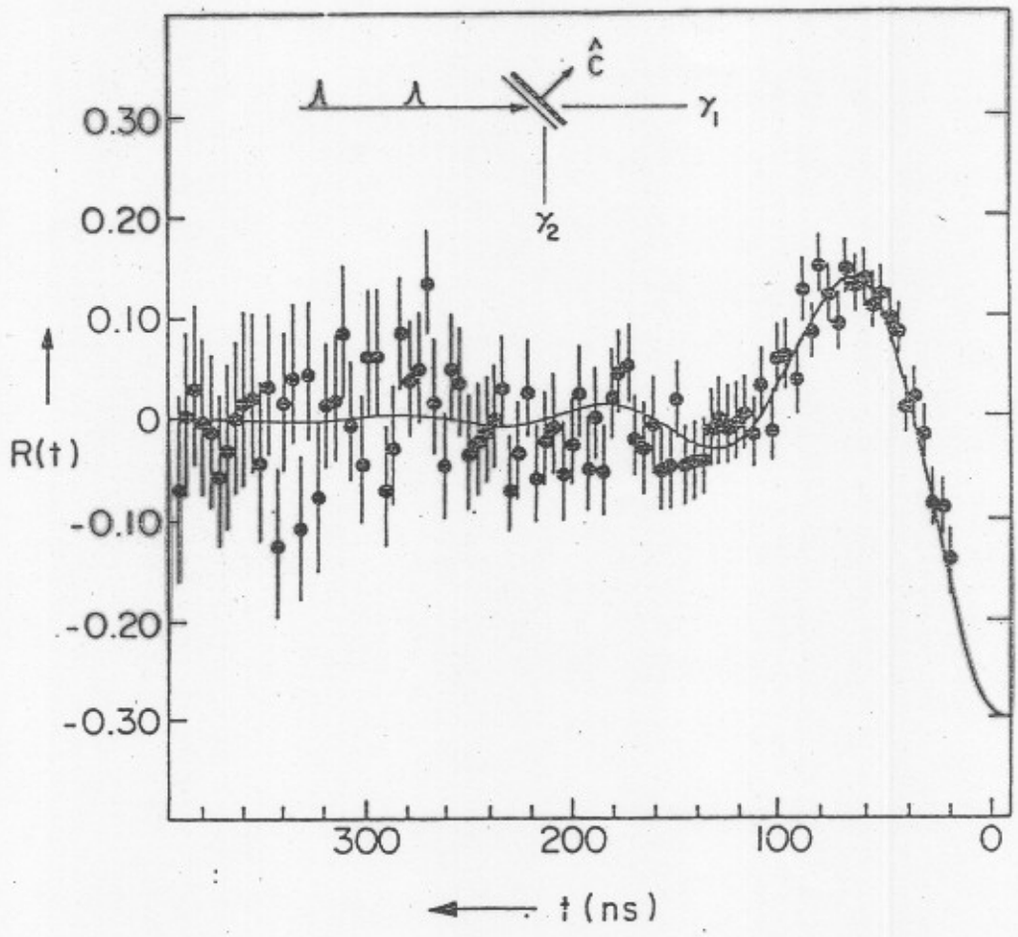
Department of Physics, Rutgers University, New Brunswick, NJ, USA




8587
510 ns
49/2+
254
E2
8333
45/2+
339
E1
7994
43/2−
3582
27 ns
27/2−
3399
25/2+
3038
23/2−
278
E1
2760
21/2+
272
E2
2572
19/2+
2488
17/2+
1491
E2
22 ns
997
13/2+
997
E3
0
7/2−
147Gd


147Gd (49/2+) Gd
254 keV
339 keV
E2
M1
R(t)
0.08
0.06
0.04
0.02
0.00
-0.02
-0.04
400
300
200
100
0
t (ns)

$^{144}Gd(10^+)$



alignment

Parity violation in the $17/2^-$ isomer of ^{93}Tc*

C. Broude[1], G. Goldring[1], M. Hass[1,**], N. Takahashi[1,***], S. Hofmann[2], F.P. Hessberger[2], and V. Ninov[2]

[1] The Weizmann Institute of Science, Rehovot, Israel
[2] Gesellschaft für Schwerionenforschung, Darmstadt, Federal Republic of Germany

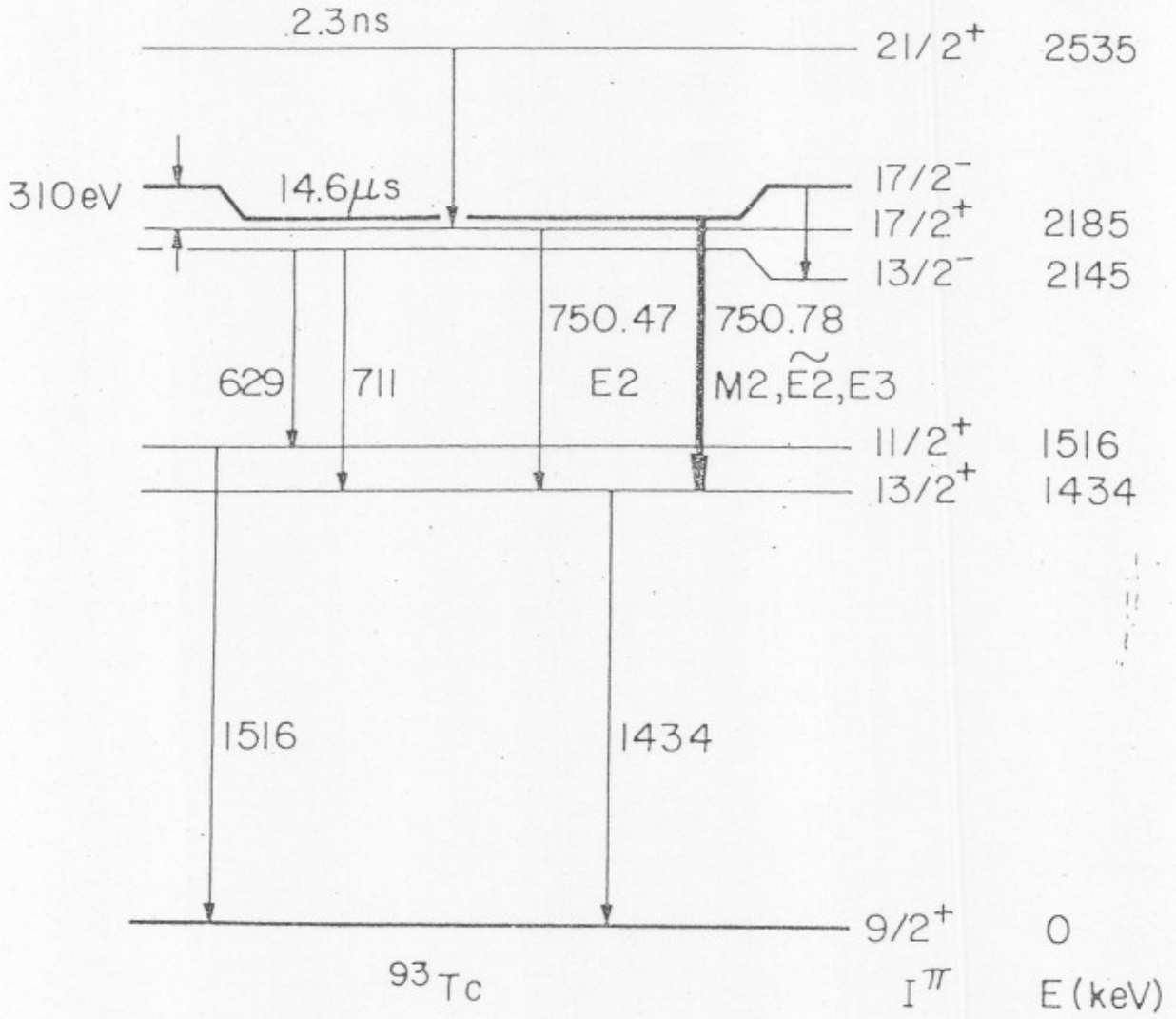
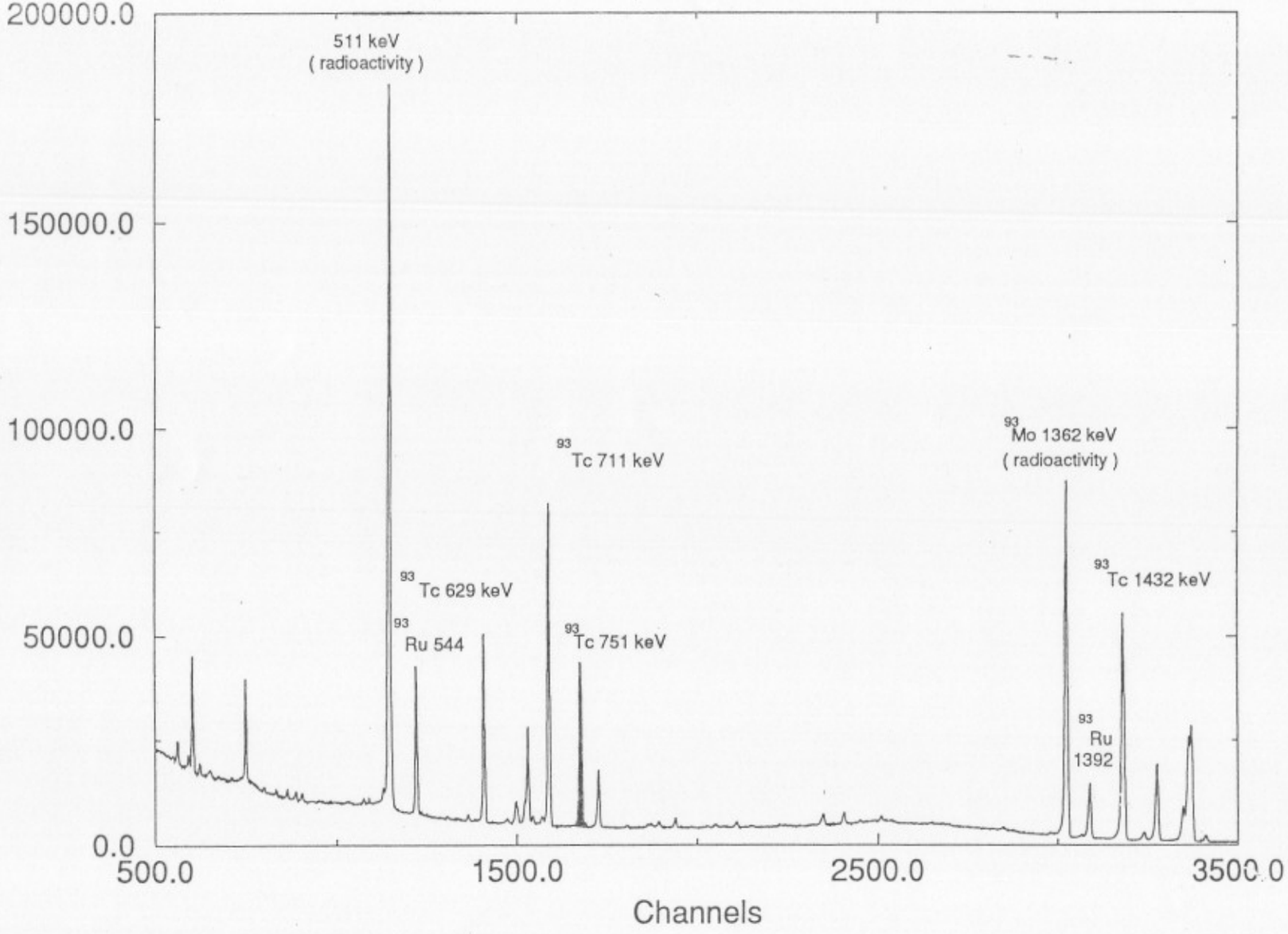


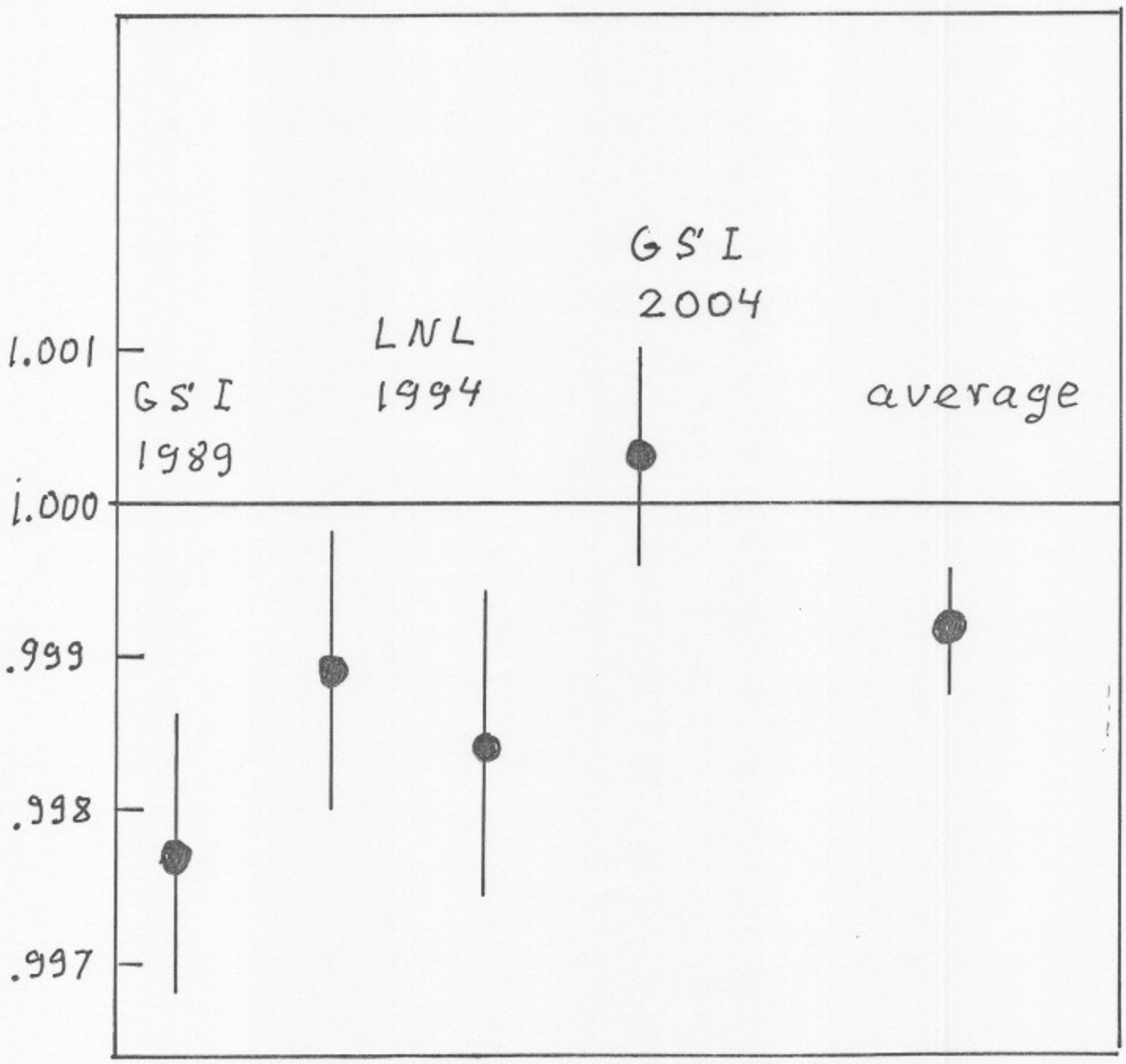
Fig. 1. Level scheme of ^{93}Tc


200000.0
150000.0
100000.0
50000.0
0.0
500.0
1500.0
2500.0
3500.0
Channels
511 keV
(radioactivity)
93 Tc 629 keV
93 Ru 544
93 Tc 711 keV
93 Tc 751 keV
93 Mo 1362 keV
(radioactivity)
93 Ru 1392
93 Tc 1432 keV

survivors

^{19}F $\frac{1}{2}^+$, $\frac{1}{2}^-$ 380(100) meV

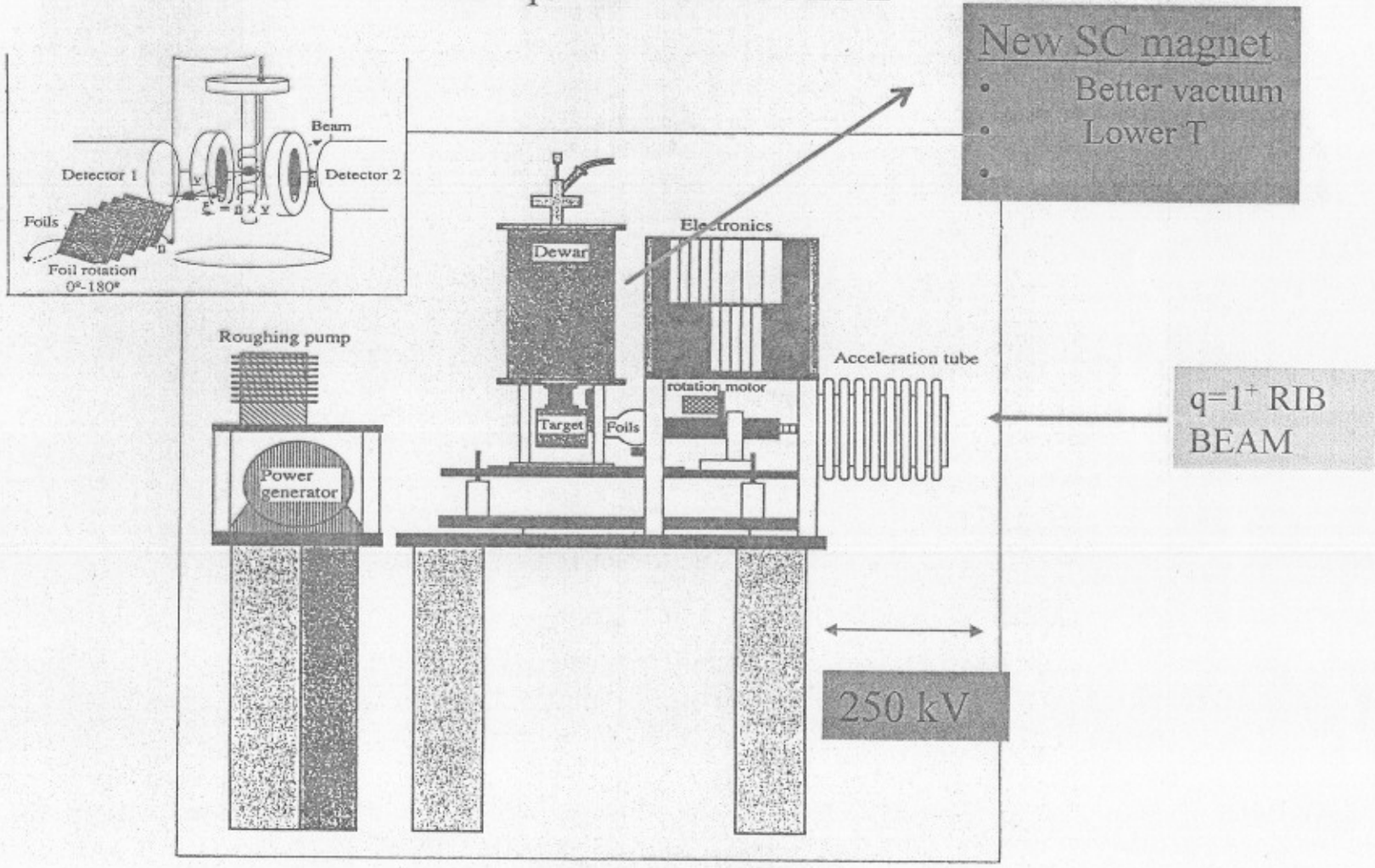
^{180}Hf 8^+, 8^- 1.0(1) μeV



Magnetic moment of ^{17}Ne using β-NMR and tilted foil polarization

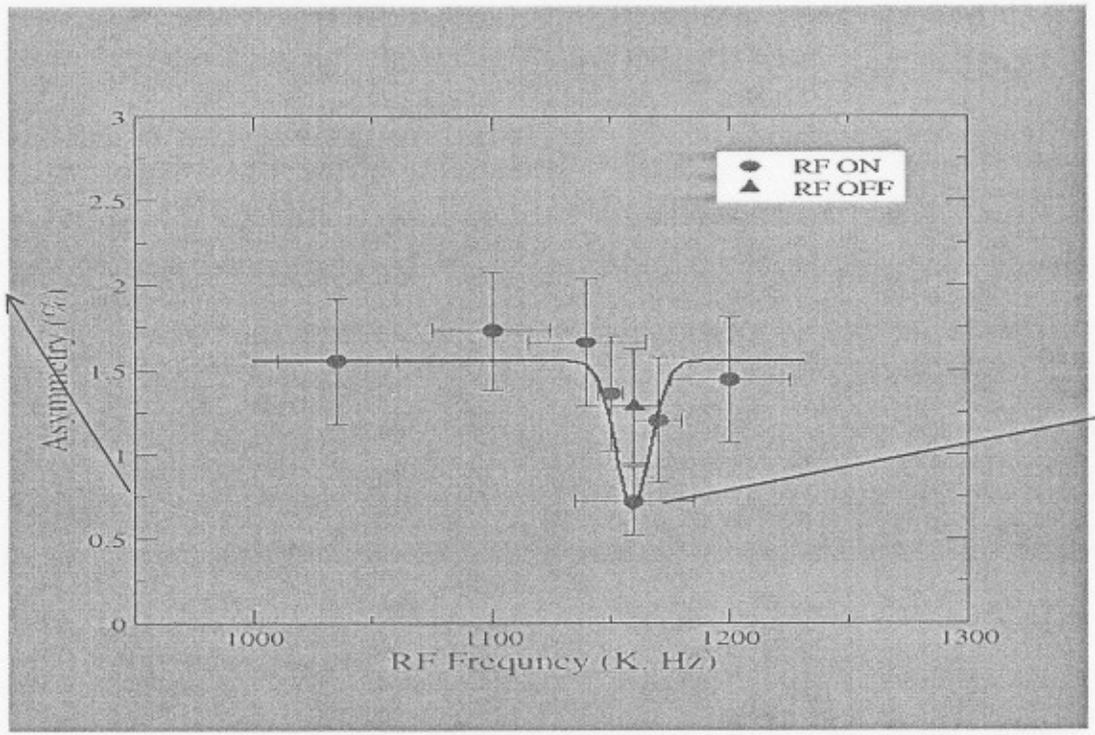
L T Baby[1], C Bordeanu[1], M Hass[1], H Haas[2], L Weissman[3] and B A Brown[3] (the ISOLDE Collaboration)

Tilted-foil polarization, β-NMR setup at the HV platform at ISOLDE



Rf resonance curve for ^{17}Ne

Asymmetry – due to ρ^1_0 term in the angular distribution



μ=0.74(3)

Higher Energies (Future):

1) **velocity – "no" multiple scattering in foils**
2) **Variety of charge states, configurations**
3) **Beams from REX, REX*, etc.**