^{100}Mo(^{20}Ne,α5nγ) 2008Ga26

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 110, 1239 (2009)	1-Feb-2008

A ^{20}Ne beam with an energy of 136 MeV from the Variable Energy Cyclotron facility at Kolkata bombarded a 4.7 mg/cm^2 ^{100}Mo target deposited on aluminum substrate. The isotopic purity of the ^{100}Mo target was 99.5%.

Detectors: detector array comprising of eight Compton-suppressed Clover Ge detectors (INGA); two detectors at 40° (forward) and two detectors at 125° (backward) with the rest at 90° with respect to the incident beam.

The details of the slowing down of the recoil was simulated using the Monte-Carlo technique.

Measured: Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma$←q)(DCO), level lifetimes by DSAM. Deduced B(E2) rates, the transition quadrupole moment (Q_t), and the quadrupole deformation (β_2) for the yrast band. Comparisons with total Routhian surface calculations.

^{111}Sn Levels

Q_t=transition quadrupole moment deduced from lifetime measurements. Deformation parameter β_2 is deduced from Q_t.

E(level)[†]	J$^\pi$	$T_{1/2}$[‡]	Comments
0.0	7/2$^+$		
978.5 *5*	11/2$^-$		
2061.6 *7*	15/2$^-$		
2983.1 *8*	19/2$^-$		
3123.3 *8*	19/2$^-$		
3227.0 *8*	19/2$^-$		
3305.9 *8*	19/2$^-$		
3322.4 *8*	21/2$^-$		
3459.4 *9*	23/2$^-$		
3620.7 *8*	23/2$^-$		
3788.6 *9*	23/2$^-$		
4074.3[#] *8*	23/2$^-$		
4445.6 *10*	25/2$^-$		
4838.9 *9*	27/2$^-$		
4877.1[#] *9*	27/2$^-$	0.492 ps *+21−28*	Q_t=2.93 *10*, β_2=0.21 *1*.
5746.9[#] *9*	31/2$^-$	0.173 ps *14*	Q_t=3.95 *+21−18*, β_2=0.28 *2*.
6688.9[#] *11*	35/2$^-$	0.152 ps *14*	Q_t=3.77 *+27−24*, β_2=0.26 *2*.
7683.8[#] *12*	39/2$^-$	0.159 ps *21*	Q_t=3.2 *3*, β_2=0.23 *2*.
8737.2[#] *13*	43/2$^-$	0.125 ps *+21−14*	Q_t=3.1 *3*, β_2=0.22 *2*.
9860.0[#] *14*	47/2$^-$	<0.14 ps	Q_t>2.53, β_2>0.18.
11079.9[#] *15*	(51/2$^-$)		
12445.6[#] *16*	(55/2$^-$)		

[†] From least-squares fit to Eγ's (by compilers).

[‡] From Doppler Shift Attenuation (DSA) using the LINESHAPE method (2008Ga26). The shell corrected stopping powers from Northcliffe-Schilling were used. Uncertainties are statistical only, estimated 15% uncertainty from stopping powers and side-feedings is not included. Estimated uncertainty from side-feeding times is 5% for most levels, except that it is 10% for 5747 level.

[#] Band(A): Intruder band Probable alignment of $\nu h_{11/2}$ neutrons at $\hbar\omega\approx$0.45 MeV. After this alignment, configuration=$\pi g_{9/2}^{-2}\otimes\nu h_{11/2}^{3}$. Shape change from collective prolate to triaxial as the spin increases with the expectation that it terminates in a 79/2$^-$ oblate non-collective state.

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$\gamma(^{111}Sn)$

DCO ratios were obtained for gates on known ΔJ=2, quadrupole transitions. Expected DCO′s are 1 for ΔJ=2, quadrupole and 0-2 for ΔJ=1, dipole+quadrupole.

E_γ †	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Comments
161.3 *5*		3620.7	23/2$^-$	3459.4	23/2$^-$	
199.2 *5*		3322.4	21/2$^-$	3123.3	19/2$^-$	
298.2 *5*		3620.7	23/2$^-$	3322.4	21/2$^-$	
314.7 *5*		3620.7	23/2$^-$	3305.9	19/2$^-$	
339.4 *5*		3322.4	21/2$^-$	2983.1	19/2$^-$	
466.2 *5*		3788.6	23/2$^-$	3322.4	21/2$^-$	
476.3 *5*		3459.4	23/2$^-$	2983.1	19/2$^-$	
637.6 *5*		3620.7	23/2$^-$	2983.1	19/2$^-$	
751.9 *5*		4074.3	23/2$^-$	3322.4	21/2$^-$	
768.5 *5*		4074.3	23/2$^-$	3305.9	19/2$^-$	
802.8 *5*	17.4 *23*	4877.1	27/2$^-$	4074.3	23/2$^-$	B(E2)(W.u.)=93 *4* DCO=0.81 *15*
847.3 *5*		4074.3	23/2$^-$	3227.0	19/2$^-$	
869.8 *5*	19.6 *25*	5746.9	31/2$^-$	4877.1	27/2$^-$	B(E2)(W.u.)=171 *+13−11* DCO=1.07 *16*
907.9 *5*	4.2	5746.9	31/2$^-$	4838.9	27/2$^-$	B(E2)(W.u.)=28 *+4−3* I_γ: intensity deduced by 2008Ga26 from branching ratios in 2005Wo03: Eur Phys J A 24, 259 (2005).
921.4 *5*		2983.1	19/2$^-$	2061.6	15/2$^-$	
942.0 *5*	16.7 *22*	6688.9	35/2$^-$	5746.9	31/2$^-$	B(E2)(W.u.)=158 *+16−14* DCO=1.18 *22*
951.0 *5*		4074.3	23/2$^-$	3123.3	19/2$^-$	
978.5 *5*		978.5	11/2$^-$	0.0	7/2$^+$	
994.9 *5*	15.0 *24*	7683.8	39/2$^-$	6688.9	35/2$^-$	DCO=1.19 *24* B(E2)(W.u.)=116 *+14−13*
1053.4 *5*	11.4 *20*	8737.2	43/2$^-$	7683.8	39/2$^-$	DCO=0.97 *22* B(E2)(W.u.)=108 *14*
1061.7 *5*		3123.3	19/2$^-$	2061.6	15/2$^-$	
1083.1 *5*		2061.6	15/2$^-$	978.5	11/2$^-$	
1088.5 *5*	3.0 *6*	4877.1	27/2$^-$	3788.6	23/2$^-$	B(E2)(W.u.)=3.5 *2*
1091.2 *5*		4074.3	23/2$^-$	2983.1	19/2$^-$	
1122.8 *5*	8.2 *26*	9860.0	47/2$^-$	8737.2	43/2$^-$	B(E2)(W.u.)>72
1123.1 *5*		4445.6	25/2$^-$	3322.4	21/2$^-$	
1165.4 *5*		3227.0	19/2$^-$	2061.6	15/2$^-$	
1218.2 *5*		4838.9	27/2$^-$	3620.7	23/2$^-$	
1219.9 *5*		11079.9	(51/2$^-$)	9860.0	47/2$^-$	
1244.3 *5*		3305.9	19/2$^-$	2061.6	15/2$^-$	
1365.7 *5*		12445.6	(55/2$^-$)	11079.9	(51/2$^-$)	

† 2008Ga26 state that uncertainties are similar to those in their earlier paper 2007Ga45 on ^{112}Sn structure, where it was 0.1 to 1.0 keV. The evaluator assign here 0.5 keV for each γ ray based on the above statement.

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Level Scheme

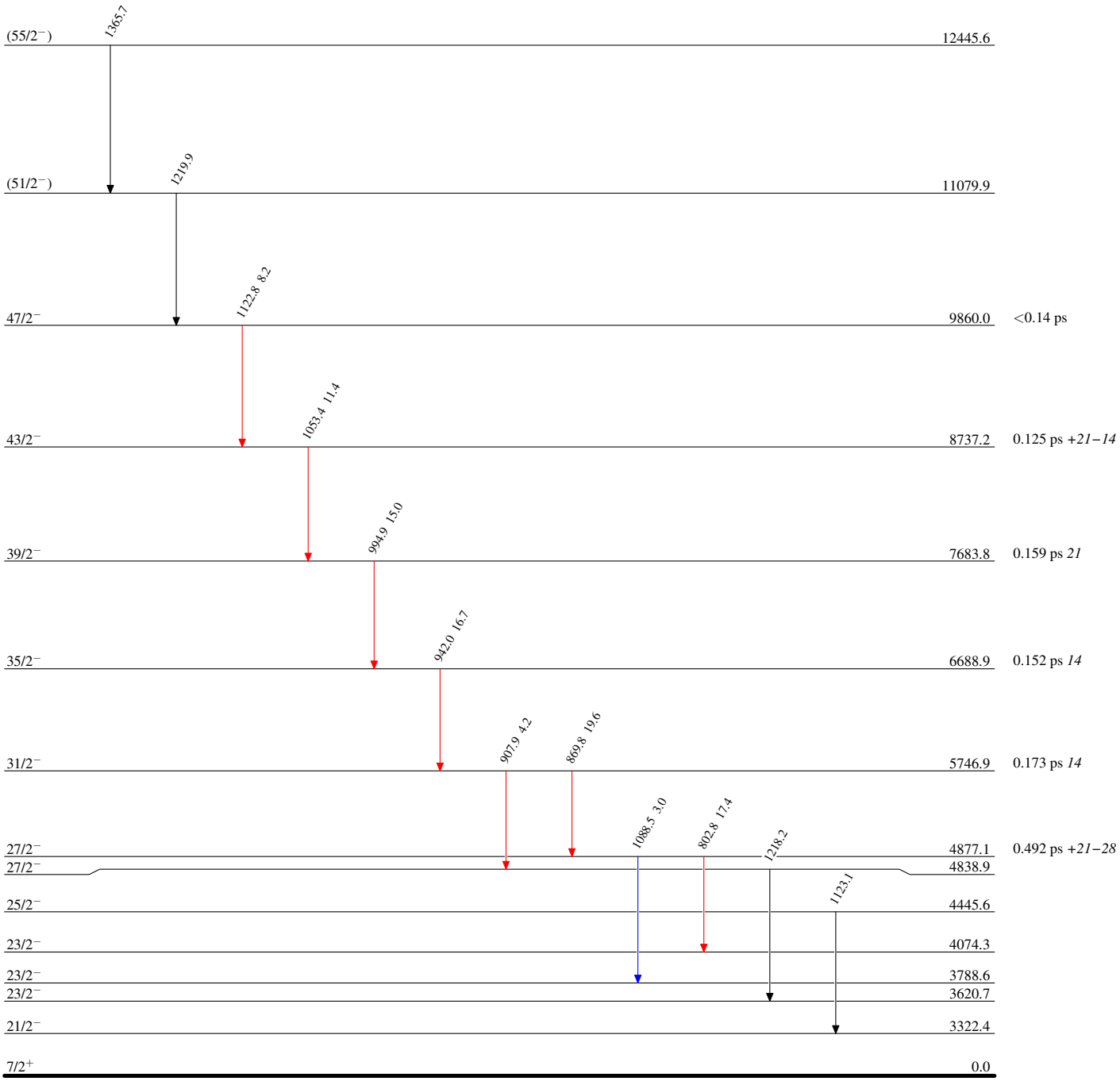
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{111}_{50}Sn_{61}$

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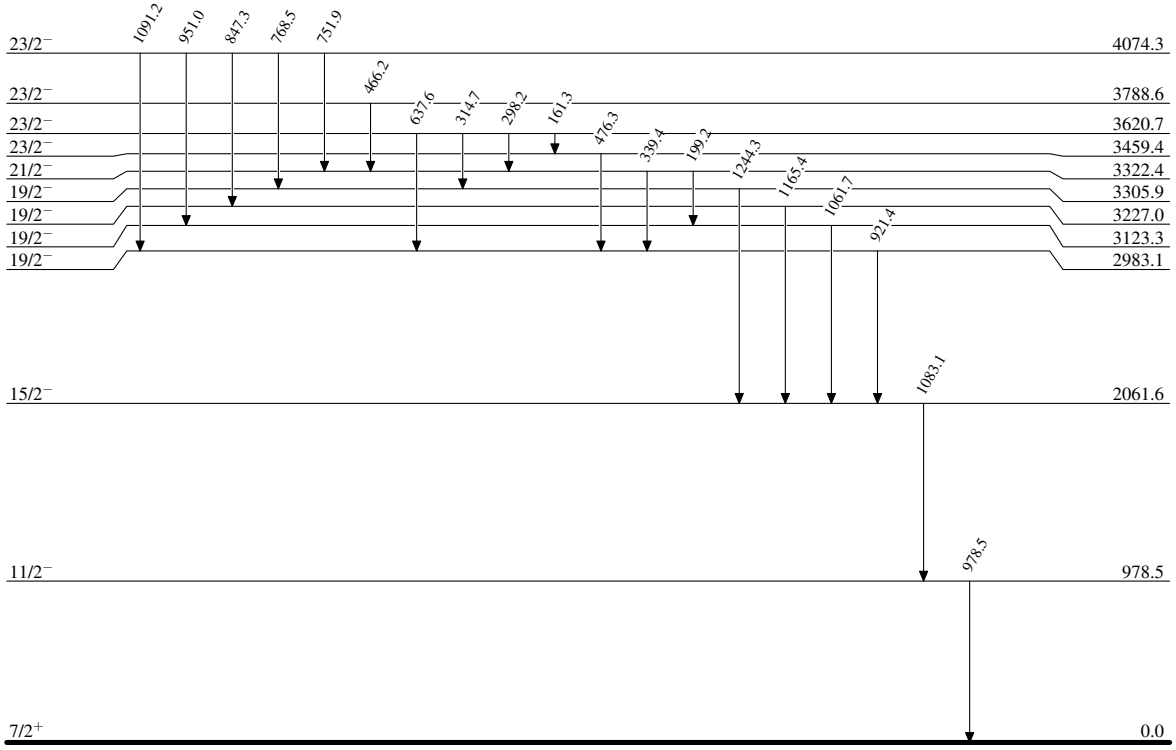
Level Scheme (continued)

Intensities: Relative I_γ



$^{111}_{50}Sn_{61}$

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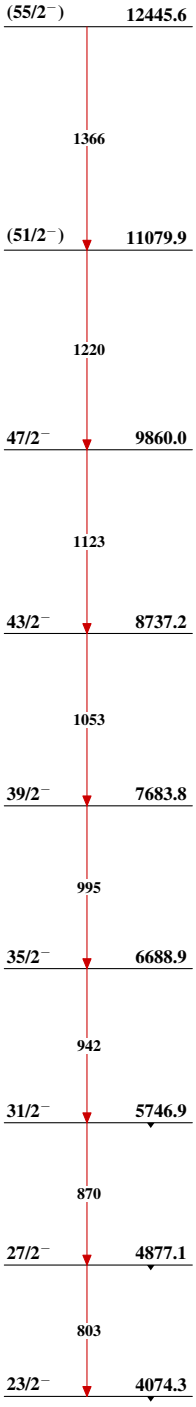
Band(A): Intruder band
Probable alignment of
$\nu h_{11/2}$ neutrons at
$\hbar\omega \approx 0.45$ MeV



$^{111}_{50}Sn_{61}$