(HI,xnγ):SD 2001La17,1995Be36

		History	
Туре	Author	Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich	NDS 110, 2257 (2009)	1-May-2008

Additional information 1. 2001La17: ¹¹⁰Pd(⁴⁸Ti,4n γ), E(⁴⁸Ti)=215 MeV. Target consisted of α stack of two self-supporting metallic foils

(thickness= $2 \times 500 \ \mu g/cm^2$) of enrichment 98.64%. Measured E γ and $\gamma \gamma$ using the EUROBALL detector array, consisting of 13 cluster detectors, 25 Clover detectors and 26 tapered escape-suppressed detectors.

1995Be36: ¹¹⁸Sn(⁴⁰Ar,4n γ), E(⁴⁰Ar)=185 Mev. Measured γ 's using 36 Compton-suppressed Ge detectors in an implementation of Gammasphere. Measured $E\gamma$, $I\gamma$, coincidences. Deduced mults for several transitions.

For model calculations related to SD bands, see for example: 1985Du01; 1987Du04; 1987Ch07; 1989Na07; 1997Ha14.

¹⁵⁴Er Levels

E(level)	\mathbf{J}^{π}	Comments	
x†	J1	 J^π: 2001La17 suggest J₁≈(24⁺), which is the value shown in the compilation of 2002Si26. This band appears to feed into the normal-deformed levels of J^π=19⁻ to 25⁻ (2001La17). Other: (26⁺) (1995Be36), from considerations of γ intensity within the SD and yrast bands. This latter value appears in the compilation of 1999Ha56. E(level): 1995Be36 infer that the likely entry region of the SD band into the states of normal deformation in ¹⁵⁴Er is near an excitation energy of 7.4 MeV. 	
696.37+x [†] 17	J1+2		
1430.72+x [†] 18	J1+4		
2207.93+x [†] 20	J1+6		
3032.37+x [†] 21	J1+8		
3907.13+x [†] 22	J1+10		
4834.58+x [†] 24	J1+12		
5814.46+x [†] 25	J1+14		
6847.0+x [†] 3	J1+16		
7932.7+x [†] <i>3</i>	J1+18		
9070.6+x [†] 3	J1+20		
10261.6+x [†] 4	J1+22		
11504.5+x [†] 4	J1+24		
12804.9+x [†] 5	J1+26		
14154.4+x [†] 5	J1+28		
y‡	J2	J^{π} : 2001La17 suggest $J_2 \approx (26^+)$. This band appears to have a feeding pattern similar to that of the SD-1 band, although it may feed levels somewhat higher up in the spectrum of states of normal deformation.	
744.73+y [‡] 20	J2+2		
1533.57+y [‡] 25	J2+4		
2367.0+y [‡] 3	J2+6		
3246.1+y [‡] 3	J2+8		
4171.6+y [‡] 4	J2+10		
5143.8+y [‡] 4	J2+12		
6162.1+y [‡] 4	J2+14		
7227.6+y [‡] 4	J2+16		
8340.2+y [‡] 4	J2+18		
9499.0+y [‡] 5	J2+20		
$10706.2 + v^{\ddagger} 5$	J2+22		

(HI,xnγ):SD 2001La17,1995Be36 (continued)

¹⁵⁴Er Levels (continued)

E(level)	J″
11959.6+y [‡] 5	J2+24
13260.2+y? [‡] 6	J2+26

[†] Band(A): SD-1 band (2001La17,1995Be36); probable triaxial shape based on a single proton N=6 intruder orbital (2001La17). Percent population=0.5% (2001La17), $\approx 0.4\%$ (1995Be36).

[‡] Band(B): SD-2 band (2001La17). Probable prolate shape (2001La17), with configuration $\pi 6^4 \nu 7^2$ (in the notation of 1988Be22). percent population is roughly 1/3 that of the SD-1 band.

 $\gamma(^{154}{\rm Er})$

E_{γ}^{\dagger}	I_{γ}^{\ddagger}	E _i (level)	\mathbf{J}_i^{π}	E_f	\mathbf{J}_f^π	Mult. [#]	Comments
696.37 17	0.21 5	696.37+x	J1+2	x	J1	[E2]	E_{γ} ; other: 695.06 25 (1995Be36).
734.35 5	1.00 8	1430.72+x	J1+4	696.37+x	J1+2	E2	E_{γ}^{\prime} : other: 734.26 23 (1995Be36). Mult.: from R=1.79 25.
744.73 20		744.73+y	J2+2	у	J2		
777.21 8	0.98 8	2207.93+x	J1+6	1430.72+x	J1+4	E2	E _γ : other: 776.73 22 (1995Be36). Mult.: from R=1.39 <i>39</i> .
788.84 15		1533.57+y	J2+4	744.73+y	J2+2		
824.44 7	0.96 9	3032.37+x	J1+8	2207.93+x	J1+6	[E2]	E_{γ} : other: 824.09 21 (1995Be36).
833.45 7		2367.0+y	J2+6	1533.57+y	J2+4		
874.76 6	0.68 7	3907.13+x	J1+10	3032.37+x	J1+8	[E2]	E_{γ} : other: 874.95 23 (1995Be36).
879.04 8		3246.1+y	J2+8	2367.0+y	J2+6		
925.56 17		4171.6+y	J2+10	3246.1+y	J2+8		
927.45 9	0.76 7	4834.58+x	J1+12	3907.13+x	J1+10	E2	E_{γ} : other: 927.51 26 (1995Be36). Mult.: from R=1.80 39.
972.13 11		5143.8+y	J2+12	4171.6+y	J2+10		
979.88 8	0.73 7	5814.46+x	J1+14	4834.58+x	J1+12	E2	E_{γ} : other: 981.04 <i>44</i> (1995Be36). Mult.: from R=1.44 <i>40</i> .
1018.36 15		6162.1+y	J2+14	5143.8+y	J2+12		
1032.58 9	0.71 9	6847.0+x	J1+16	5814.46+x	J1+14	E2	E_{γ} : other: 1032.14 20 (1995Be36). Mult.: from R=1.40 47.
1065.53 10		7227.6+y	J2+16	6162.1+y	J2+14		
1085.61 10	0.71 8	7932.7+x	J1+18	6847.0+x	J1+16	E2	E_{γ} : other: 1085.24 22 (1995Be36). Mult.: from R=1.78 62.
1112.59 11		8340.2+y	J2+18	7227.6+y	J2+16		
1137.98 13	0.63 7	9070.6+x	J1+20	7932.7+x	J1+18	E2	E_{γ} : other: 1137.88 <i>30</i> (1995Be36). Mult.: from R=1.27 <i>52</i> .
1158.81 12		9499.0+y	J2+20	8340.2+y	J2+18		
1190.95 23	0.63 7	10261.6+x	J1+22	9070.6+x	J1+20	E2	E_{γ} : other: 1191.39 28 (1995Be36). Mult.: from R=1.61 40.
1207.19 13		10706.2+y	J2+22	9499.0+y	J2+20		
1242.93 11	0.41 7	11504.5+x	J1+24	10261.6+x	J1+22	[E2]	E_{ν} : other: 1243.84 34 (1995Be36).
1253.39 18		11959.6+y	J2+24	10706.2+y	J2+22		1
1300.39 18	0.37 6	12804.9+x	J1+26	11504.5+x	J1+24	[E2]	E_{γ} : other: 1301.93 51 (1995Be36).
1300 54 ^{&} 24		$13260.2+v^{2}$	I_{2+26}	11959 6+v	I_{2+24}		· · · · · · ·
1349.49.20		14154.4 + x	J1+28	12804.9 + x	J_{1+26}	[E2]	
^x 1368.4 [@] 12	0.12 8	1.10	01120	1200 H9 FA	51120	[22]	
^x 1424.26 [@] 39	0.30 8						

[†] From 2001La17.

(HI,xnγ):SD 2001La17,1995Be36 (continued)

 $\gamma(^{154}\text{Er})$ (continued)

[‡] From 1995Be36. 2001La17 do not report γ intensities.

[#] From an asymmetry ratio R (1995Be36), defined to be $R=I\gamma$ (forward+backward angles)/ $I\gamma$ (90°). For stretched quadrupole transitions, R=1.59 25; and, for stretched dipoles, R=0.82 24. Stretched quadrupole transitions are assigned E2. ^(a) γ reported by 1995Be36, but not placed in their SD band.

[&] Placement of transition in the level scheme is uncertain. ^x γ ray not placed in level scheme.

2001La17,1995Be36

(HI,xnγ):SD

Legend

 $I_{\gamma} < 2\% \times I_{\gamma}^{max}$ $I_{\gamma} < 10\% \times I_{\gamma}^{max}$ $I_{\gamma} > 10\% \times I_{\gamma}^{max}$ $\gamma \text{ Decay (Uncertain)}$ Level Scheme Intensities: Relative I_{γ} ----1300.54 13260.2+y <u>J2+26</u> (^{233,34} 11959.6+y J2+24 13021 10706.2+y J2+22 1/38.81 9499.0+y J2+20 1113 8340.2+y J2+18 1005 1333 7227.6+y J2+16 1018.1 6162.1+y J2+14 156 5143.8+y J2+12 |<u>5</u>5| 4171.6+y J2+10 1028 3246.1+y 8331 J2+8 199.98 2367.0+y J2+6 1 244 Ľ J2+4 1533.57+y (E2)0.37 744.73+y J2+2 J2 J1+28 ¥ у + 124203 (182)04 | | 1300.30 14154.4+x + 1999 12804.9+x <u>J1+26</u> + 1/32 965 11504.5+x <u>J1+24</u> 12:023 19:301 H J1+22 10261.6+x + 103.58 2201 9070.6+x J1+20 [€]

¹°

¹°<b 7932.7+x J1+18 ارچه ا ارچه ا مزیر که ا 6847.0+x <u>J1+16</u> + 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 82; | 1, 8 J1+14 5814.46+x + 824 | | 424 | | 426 | | 426 | J1+12 4834.58+x *d*. J1+10 3907.13+x Ŵ Ş 12. <u>J1+8</u> 3032.37+x Ŵ (ESIN) 234 35 2207.93+x J1+6 . 69 | .3> | <u>J1+4</u> 1430.72+x J1+2 696.37+x J1 х

¹⁵⁴₆₈Er₈₆

(HI,xnγ):SD 2001La17,1995Be36

	Band(B): SD-2 band (2001La17)		
	<u>J2+26</u> <u>13260.2+y</u>		
	J2+24 11959.6+y		
	J2+22 10706.2+y		
	J2+20 9499.0+y		
	J2+18 ¹¹⁵⁹ 8340.2+y		
	J2+16 ¹¹¹³ 7227.6+y		
	J2+14 ¹⁰⁶⁶ 6162.1+y		
	J2+12 ¹⁰¹⁸ 5143.8+y		
	J2+10 972 4171.6+y		
Band(A): SD-1 band	J2+8 ⁹²⁶ 3246.1+y		
(2001La17,1995Be36); probable triaxial shape	J2+6 ⁸⁷⁹ 2367.0+y		
based on a single proton N=6 intruder orbital	J2+4 ⁸³³ 1533.57+y		
(2001La17)	J2+2 ⁷⁸⁹ 744.73+y		
J1+28 14154.4+x	J2 745 y		
1349 J1+26 12804.9+x			
1300 J1+24 11504.5+x			
J1+22 10261.6+x			
J1+20 9070.6 +x			

N=6 intruder orbital (2001La17) J1+28 14154.4+x 1349 J1+26 12804.9+x 1300 11504.5+x J1+24 1243 10261.6+x J1+22 1191 9070.6+x J1+20 1138 7932.7+x J1+18 1086 6847.0+x J1+16 ¹⁰³³ 5814.46+x J1+14 ⁹⁸⁰ 4834.58+x J1+12 ⁹²⁷ 3907.13+x J1+10 ⁸⁷⁵ 3032.37+x J1+8 ⁸²⁴ 2207.93+x J1+6 ⁷⁷⁷ 1430.72+x J1+4 ⁷³⁴ 696.37+x J1+2 J1 696 X

¹⁵⁴₆₈Er₈₆