

$^{50}\text{Ti}(\text{p},\text{p}')$ 1985Fu10,1970Pr08,1983Dj05

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh		NDS 157, 1 (2019)	15-Apr-2019

1985Fu10,1989Fu07: $E_p=65$ MeV beam from the AVF cyclotron at RCNP. Measured $\sigma(\theta=10^\circ-70^\circ, E_x \leq 5 \text{ MeV}; 7^\circ-65^\circ, E_x > 5 \text{ MeV})$; magnetic spectrograph, position-sensitive proportional counters, two ΔE proportional counters, scintillation detectors, FWHM=15-22 keV. DWBA analysis.

1970Pr08: $E_p=40$ MeV beam from the Michigan State University sector-focused cyclotron. Measured $\sigma(\theta)$; Ge(Li) in surface barrier configuration, FWHM ≈ 40 keV. DWBA.

1983Dj05: Measured $\sigma(\theta=2^\circ-7^\circ)$; FWHM ≈ 60 -70 keV. DWIA. Only those transitions which showed a forward-peaked angular distribution were discussed by 1983Dj05.

All data are from 1985Fu10, except as noted. Others: 1973El08, 1990To05.

 ^{50}Ti Levels

See 1970Pr08 for $B(E\lambda)\uparrow$ and 1985Fu10 for percent fractions of the energy-weighted sum rule.
Additional information 1.

E(level) [†]	L	$\beta_{LR}^{\ddagger}$	Comments
0			
1555 [#] 20	2 [#]	0.71 [#]	
2675 5	4 [@]	0.40	
3198 ^{&} 5	6	0.16	
3870 10	2 [#]	0.21 [#]	
4147 5	4 [@]	0.19	
4172 5	2	0.24	
4311 5	2	0.27	
4410 5	3	0.66	
4788 5	2	0.26	
4940 [#] 20	2 [#]	0.19 [#]	
5203 [#] 20	3 [#]	0.16	
5329 ^{&} 5	5,6		
5378 5	4 [@]	0.21	
5433 ^{&} 5	4 [@]	0.081	
5560 [#] 20	3 [#]	0.20 [#]	
5679 5	2	0.099	
5787 5	4 [@]	0.23	
5817 5	4 [@]	0.17	
5945 5	3	0.09	E(level): 5840 20 (1970Pr08).
6044 ^{&} 5	3	0.11	
6127 ^{&} 5			
6166 ^{&} 5			
6213 ^{&} 5			
6380 ^{&} 5	3(+5,6)	0.16	β_{LR} : for L=3.
6476 5	4 [@]	0.094	
6519 5	4 [@]	0.31	
6609 5	3	0.31	E(level): possible doublet. 1970Pr08 report two L=3 transitions at 6550 20 and 6630 20.
6709 5	4 [@]	0.23	
6864 5	5,6		
6975 5	2,3,4		

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$^{50}\text{Ti}(\text{p},\text{p}')$ **1985Fu10,1970Pr08,1983Dj05 (continued)** ^{50}Ti Levels (continued)

E(level) [†]	J ^π	L	$\beta_{\text{LR}}^{\ddagger}$	Comments
7047 <i>10</i>		3	0.14	
7078 <i>10</i>		3	0.37	
7115 <i>10</i>	1 ⁺ <i>c</i>	0 ^f		
7210 & <i>10</i>		3	0.088	
7231 & <i>10</i>		2	0.10	
7335 & <i>10</i>		2	0.071	
7367 <i>10</i>		3	0.18	
7482 & <i>10</i>				
7536 & <i>10</i>		3	0.14	
7577 & <i>10</i>		0		
7650 & <i>10</i>		5,6		
7700 <i>10</i>		3	0.23	
7862 <i>10</i>		0		
7925 <i>10</i>		5		
8035 <i>10</i>		4 [@]	0.13	
8074 <i>10</i>	1 ⁺ <i>c</i>	0 ^d		E(level): 8040 20 (1983Dj05).
8148 <i>10</i>				
8205 <i>10</i>		3	0.985	
8238 <i>10</i>		0		
8287 <i>10</i>		3	0.989	
8444 <i>10</i>		0		
8578 <i>10</i>		3	0.14	
8606 <i>10</i>	1 ⁺ <i>c</i>	0 ^d		E(level): 8560 20 (1983Dj05).
8726 <i>10</i>		(1)		
8810 ^e 20	1 ⁺ <i>c</i>	0 ^e		
8815 <i>10</i>		3	0.11	
8881 <i>10</i>		3	0.098	
8971 <i>10</i>		3	0.12	
9030 ^e 20	1 ⁺ <i>c</i>	0 ^e		
9127 <i>10</i>		4,5		
9210 ^e 20	1 ⁺ <i>c</i>	0 ^e		
9232 <i>10</i>		4,5		
9282 <i>10</i>		5,6		
9339 <i>10</i>		3	0.089	
9367 <i>10</i>				
9391 <i>10</i>		4 [@]	0.11	
9504 <i>10</i>				
9508 <i>10</i>		5,6		
9550 <i>10</i>		<i>g</i>		
9614 <i>10</i>	1 ⁺ <i>bc</i>	0 ^d		E(level): 9640 (1983Dj05).
9752 <i>10</i>		3	0.980	
9790 ^{ae}	1 ⁺ <i>bc</i>	0 ^e		
9809 <i>10</i>		<i>g</i>		
9842 <i>10</i>		4,5		
9909 <i>10</i>		3	0.11	
9964 <i>10</i>	1 ⁺ <i>bc</i>	0 ^d		E(level): 9930 (1983Dj05).
9999 <i>10</i>		3	0.098	
10049 <i>10</i>	1 ⁺ <i>bc</i>	0 ^d		E(level): 10040 (1983Dj05).
10160 <i>10</i>	1 ⁺ <i>bc</i>	0 ^f		E(level): 10180 (1983Dj05).
10205 <i>10</i>		0		
10237 <i>10</i>				
10364 <i>10</i>	1 ⁺ <i>bc</i>	0 ^d		E(level): 10330 (1983Dj05).

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$^{50}\text{Ti}(\text{p},\text{p}')$ 1985Fu10,1970Pr08,1983Dj05 (continued) ^{50}Ti Levels (continued)

<u>E(level)[†]</u>	<u>J^π</u>	<u>L</u>	<u>β_LR[‡]</u>	<u>Comments</u>
10478 10	1+ ^{bc}	0 ^d	0.11	E(level): 10450 (1983Dj05).
10495 10		3		
10570 20	1+ ^{bc}	0		
10760 ^a	1+ ^{bc}	0		
10910 20	1+ ^{bc}	0		
15390 20	1+ ^c	0		

[†] $^{50}\text{Ti}(\text{p},\text{p}')$ was not studied by 1970Pr08 above ≈ 8 MeV excitation energy; while 1983Dj05 report peaks only above ≈ 7 MeV.

[‡] Deformation length.

From 1970Pr08.

@ $E_0=6.3$ MeV 2 and $\Gamma=1.0$ MeV 3 for the low-energy hexadecapole resonance (1989Fu07).

& Not reported by 1970Pr08.

^a Mean value of the excitation energy. The overlap with neighboring peaks and the uncertainties in the background precluded an accurate determination of the excitation energy and strength.

^b Centroid of strength for these states is 10.29 MeV 25 and $\Sigma\sigma(4^\circ)=3.6$ mb/sr. This centroid energy is close to that of the single strong peak observed by 1983Dj05 in ^{48}Ca and $\Sigma\sigma(4^\circ)$ is the same, within uncertainties, as that of the ^{48}Ca peak. Therefore, 1983Dj05 suggest that all these states arise mainly from the splitting of the $\nu(f_{7/2}^{-1}f_{5/2})$ configuration.

^c From L value and theory (at 201 MeV, $V_{\sigma\tau}$ part of the nucleon-nucleon interaction is strongly enhanced compared to the V_{00} part through which 0^+ states may be excited and also with respect to the $V_{\sigma 0}$ and $V_{0\tau}$ parts) (1983Dj05).

^d Same value from 1983Dj05.

^e From 1983Dj05.

^f From 1983Dj05.

^g High spin (1985Fu10).