

EXP1904: Reference reaction - Analyzing #397

Variation of the parameters

11/15/2019 02:43 PM - Vratislav Chudoba

Status:	Открыта	Start date:	11/15/2019
Priority:	Нормальный	Due date:	
Assignee:	Ivan Muzalevsky	% Done:	82%
Category:		Estimated time:	0.00 hour
Target version:			

Description

Initial form of the ^9Li missing mass will be determined in this issue together with input parameters. All variations of the stated parameters will be reported as an individual subtask of this issue.

The initial parameters:

number	parameter	value	unit
1	beam energy	beamDet thickness: 630 micron of Si	
2*	thin SSD calibration parameters	pars for 2 thin detector (ssd_20u_2.cal) from issue 284 pars for 1 3 and 4 detectors from issue 391 (SSD_20u_1_cal.t xt , SSD_20u_3_cal.t t SSD_20u_4_cal.t t)	
3	thick SSD calibration parameters	issue 391	
4	central DSD calibration parameters	issue 391	
5	thin detector front dead layer	not used	mcm
6	thin detector rear dead layer	not used	mcm
7	thick SSD front dead layer	issue 391	mcm
8	thin detector position	issue 293	mm
9	thick detector position	issue 293	mm
10	central DSD position	(0,0,323)	mm
11	target density (same pressure as for ^7H)	0.0020646	g.cm^{-3}
12	target density, low	0.001005	g.cm^{-3}
13**	full target thickness	6	mm
14	target mylar window thickness	3.5	mcm

15	target stainless steel window thickness	6	mcm
16***	CsI calibration parameters	not used	
17	map of thickness for thin SSD	issue 392	
18	target selection	circle of 9 mm radius with center in (0.4673,0.0262) mm at the target plane	
19	MWPC positions	MWPC1 (-0.9,-3,-815) MWPC2 (0.3,-1.55,-270)	mm

* Energy deposit in the first layer of side telescopes is calculated according to the map of thickness. Calibration parameters are used exclusively for particle identification.

** Target is taken as a cylinder of homogeneous thickness for the purposes of reconstruction.

*** When needed, identification of ⁹Li is performed without calibration parameters using the CsI response in channel values.

Two expositions are at disposal:

- for the thin gaseous target (be10_ct_39* and be10_ct_40*)
- for the thick gaseous target (be10_ct_*)

Provide the resulting spectrum together with the mean value of the ground state in two separate comments:

- one spectrum from all telescopes for the thin target;
- one spectrum from all telescopes for the thick target and four spectra for individual telescopes.

Subtasks:

Analyzing # 399: Target thickness	Открыта
Analyzing # 400: Z-position of the side telescopes	Открыта
Analyzing # 414: Offsets of the 3He telescope	Открыта
Developing # 416: BeamDet thickness	Открыта
Developing # 418: thin detector thickness variation	Открыта
Analyzing # 420: Effect of rime growing on target surface	Открыта

History

#1 - 11/15/2019 03:01 PM - Ivan Muzalevsky

- Description updated

#2 - 11/15/2019 04:04 PM - Vratislav Chudoba

- Description updated

#3 - 11/15/2019 04:49 PM - Ivan Muzalevsky

- Description updated

#4 - 11/15/2019 05:09 PM - Ivan Muzalevsky

- Description updated

The content was deleted on 17.01.2020. The deleted results were incorrect.

#5 - 11/18/2019 12:25 PM - Ivan Muzalevsky

- Description updated

#6 - 01/15/2020 10:28 AM - Ivan Muzalevsky

- Description updated

#7 - 01/15/2020 11:12 AM - Vratislav Chudoba

- Description updated

- Assignee set to Ivan Muzalevsky

#8 - 01/15/2020 11:22 AM - Ivan Muzalevsky

- Description updated

- Assignee deleted (Ivan Muzalevsky)

#9 - 01/15/2020 11:43 AM - Vratislav Chudoba

- Description updated

- Assignee set to Ivan Muzalevsky

#10 - 01/17/2020 07:23 AM - Ivan Muzalevsky

- Description updated

#11 - 04/21/2020 06:03 PM - Ivan Muzalevsky

Summed spectrum from all 4 telescopes for thin target

Green lines - coincidence with ^9Li

mm_thin.png

The position of the g.s. is **0.048 MeV** which was estimated as a mean value of the main peak of the black histogram

Separated spectra from 4 telescopes for thick target

Red lines - ground state selection

mm_diff.png

Ground state positions (means of red histograms):

-0.118 MeV (776 events)

0.359 MeV (634 events)

0.085 MeV (712 events)

0.149 MeV (711 events)

Summed spectrum from all 4 telescopes for thick target

Green lines - coincidence with ^9Li

mm_thick.png

From the summed spectrum the g.s. position was calculated as a statistical average from 4 values:

position = $(-0.118071 \cdot 776 + 0.358727 \cdot 634 + 0.0849232 \cdot 712 + 0.149297 \cdot 711) / 2833 = \mathbf{0.107 \text{ MeV}}$

#12 - 04/21/2020 06:06 PM - Ivan Muzalevsky

- Description updated

#13 - 04/21/2020 06:07 PM - Ivan Muzalevsky

- Description updated

#14 - 04/21/2020 06:08 PM - Ivan Muzalevsky

- Description updated

#15 - 04/21/2020 06:08 PM - Ivan Muzalevsky

- Description updated

#16 - 04/24/2020 06:13 PM - Ivan Muzalevsky

- Description updated

#17 - 04/26/2020 11:26 AM - Ivan Muzalevsky

- Description updated

#18 - 07/17/2020 10:13 PM - Ivan Muzalevsky

- Description updated

#19 - 07/20/2020 01:26 PM - Ivan Muzalevsky

- Description updated

#20 - 07/20/2020 01:26 PM - Ivan Muzalevsky

- Description updated