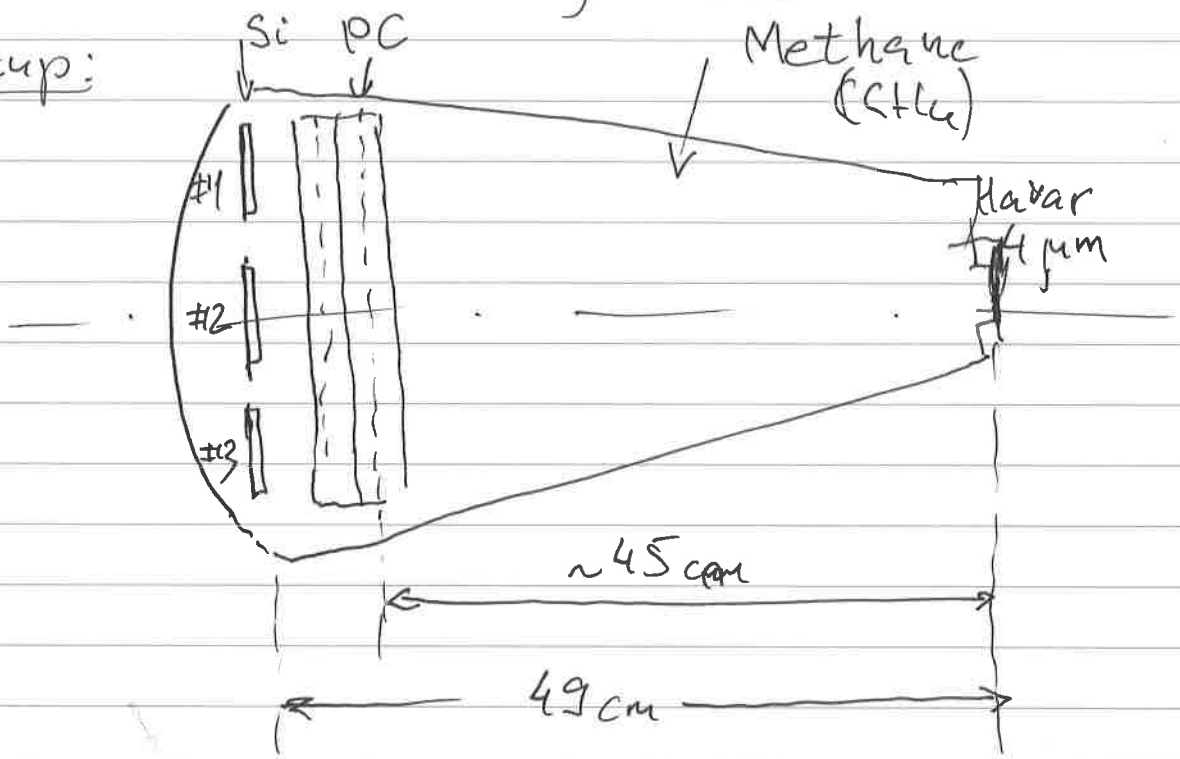
06/10/2014

^{12}C (33 MeV) on SEE-line

Setup:



Si detectors: ~1 mm thick

Bias: −120 V (channel #1 MPOD slot 6)

9:

Cable #1: Silicon

Cable #2: Proportional Counter

Cable #3: Master Trigger

Run 1 file: C12-test_beam_001001.root

start: 12:48:42

stop: 13:47:40

Vacuum, no gas. Only getting 10%-20% of the beam

Should only see signals along the beam axis.

Scintillator shows about 250-300 events/s

Run 2 file: C12-test_beam_002001.root

start: 14:19:59

stop: 14:34:32

Optimized beam rate, now get more than scintillator read out

Still no gas in chamber and under vacuum.

Gain for Run 1 & 2 was set to 3.

Run 3 file: c12-test_beam_003001.root

start: 15:40:49

stop: 15:47:53

Chamber filled with methane at 50 torr.

Observed ionization chamber's signal is low, maybe all noise.

Possible causes: gas is not right, voltage is not high enough

Still running at uncalibrated scale due to gain set at 3 instead of 7.

Run 4 file: c12_test_beam_004001.root

start: 15:48:39

stop: 15:54:07

Changed gain to 7. Gas is still at 50 torr.

Run 5 file: c12_test_beam_005001.root

start: 16:35:45

stop: 16:46:41

Pressure changed to 80 torr. gain is set to 7. Ionization chamber looks better. No events, gas is stopping the beam. Increased intensity of beam by factor of 10 so events are seen in silicon. ~~(2 events/s)~~ In the middle of the run, we increased the intensity of the beam by another factor of 10. Bias on proportional counter was set to 650V.

Run 6 file: c12_test_beam_006001.root.

start: 17:09:38

stop: 17:20:21

Pressure change to 70 torr. Proportional counter now on.

Run 7. file: c12_test_beam_007001.root

start: 17:21:27

stop: 17:31:49

Continuation of run 6.

Run 8

file: c12_test_beam_008001.root

start: 17:53:20

stop: 18:00:55

Pressure at 50 torr

Run 9

file: c12_test_beam_009001.root

start: 18:47:41

stop: 18:49:44

Pressure at 400 torr. Closed shutter near beginning of run. ~~Never~~ Ended shortly after closing shutter.

Run 10

file: c12_test_beam_010001.root

start: 19:49:44

stop:

Run 11

file: c12_test_beam_011001.root

start: 19:53:44

stop: 20:09:17

Continuation of run 10.

Run 12

file: c12_test_beam_012001.root

start: ~~19~~ 20:10:52

stop: 20:28:30

Changed gain of proportional counters from 0 to 5.

Stop run, happy ☺

06/11/2014

Determined that either the detectors are not centered or the chamber is tilted.

Run 13 File: c12_test_beam_013001.root
Start: 17:38:17
Stop:
pressure: 350 torr

USE For beam E determination

Discovered that the proportional counters do not function when the bragg peak of the incoming ions occurs within the cell. With 360 torr, signals from the prop counter were small and extended. Reducing pressure to 350 torr the signals increased significantly in the proportional counter in size.

* DO NOT STOP BEAM IN PROP COUNTER

Run 14 File: c12_test_beam_014001.root
Start: 18:06:52
pressure: 400 torr

Run 15 File: c12_test_beam_015001.root

Continuation of the last run with intensity ~~magnitude~~ 10x higher.

390 stops in proportional counter
--- changing to 395 torr.

Current Settings for Module 1 (Si)

Gain: 15, 7, 7, 7
Thresholds: 255 for 0, 20 for all else
Shaping: 3, 3, 3, 3,

For Module 0 (prop) we are running in common mode
Gain = 5
Shaping = 2

→ PRODUCTION FINALLY!!

Run 16

Start: 20:05:01
file: cl2_test_beam_016001.root
pressure: 397 torr

Moving down to counting room

Grigory 850-491-6377

Yevgeniy 850-345-7587

Run 17

file: cl2_test_beam_017001.root
pressure: 357 torr

~~[redacted]~~ DAQ Crashed!!!

Run 18

file: cl2_test_beam_018001.root
pressure: 397 torr

Run 18 is junk
some problems recovering daq.

Run 19

Start: 21:06:16
pressure: 397 torr / 405 torr
File: c12_test_beam_014001.root

SEEMS OK AFTER RESET

Steps to start a run:

(1) IN Analysis Manager, make sure that All spectra are cleared with the "clear arrays" button on the triumph analysis tab under histograms. (or not if want to accumulate)

(2) Press "Start AEQ" in the Transport Manager
   a) If writing to disk, make sure run number has incremented and file prefix is correct
   b) supervisor must be entered

(1.5) (3) Make sure that "begin" is pressed on analysis manager.

To stop run:

① Press stop REQ on transport manager

To start Anl program:

① Navigate to ~/triumf_backend
② Type Anl
③ Open Anl only after launching TMR!

To start Tmr program:

① ssh into grgroup@cycfegro1
② navigate to ~/triumf_frontend
③ Type Tmr usb

Calculating peak energies:

From run 13, w/ 350 torr 12C peak appears at ~ 2596 keV

⇒ 78.497 MeV beam energy
⇒ 74.033 after window

Resonance energies CM Frame:

① 421.4 keV $J = \frac{1}{2}^+$
② 1558.49 $J = \frac{3}{2}^-$
③ 1603.49 $J = 5/2^+$

Penetration distance:

①	~~48.18~~ cm	42.48 cm
②	~~42.43~~ cm	37.41 cm
③	~~42.14~~ cm	37.16 cm

Run 20

file: c12_test_beam_00001.root

Start: 23:05:52

press.: 397 torr / 405 torr

back to calculation

Proton scattering energies	After loss
① 1.556 MeV	~~1.5936 MeV~~
② 5.754 MeV	0.873 MeV
③ 5.92 MeV	5.336 MeV
	5.5015 MeV

High energy peak in 2.3 @ 5.4 MeV

Low energy " " @ 0.9 MeV

CONSISTANT !

If peaking beam, replace attenuators ← for AT

Ask to peak if ICR < 4000

Ethan: 574-807-1848

Run 21

file: c12-test_beam_021001.root

start: 00:42:39

press: 397 torr / 405 torr

Run 22

file: c12-test_beam_022001.root

start: 02:16:57

press: 397 torr / 405 torr

Run 23

file: c12-test_beam_023001.root.

start: 03:57:25

press: 397 torr / 405 torr

Run 24

file: c12-test_beam_024001.root

start: 05:38:24

press: 397 torr / 405 torr

Run 25

file: c12_test_beam_025001.root

start: 07:18:44

press: 397 torr / 405 torr

stop: 08:51:36

Increased gas pressure to 1020 torr, switch ion chamber out of trigger

Run 26

Start: 11:21:51
pressure: 1020 torr / 1000 torr
file: c12_test_beam_027001.root

LAST RUN ~~I~~ PROP COUNTER HAD WRONG SHAPING TIME. STOPPED.

Run 27

start: 11:29:48
presure 1020 / 1000
file: c12_test_beam_027001.root

GAIN SEEMS TO HIGH
STOPPED + Changed from 3 to 5

Run 28

JUNK

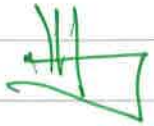
Run 29

Rest gain back to 5
pressure: 1020/1000
start: ~~11:29:8~~ 12:29:10
file: c_12_test_beam_029001.root

Seems that gain is too low, increasing by 2

Run 30

increased bias by 200V
Started run but gain was
to low. [Reran with
gain set to 3 instead of 5.]



Run 31

file: d12_test_beam_030001.root
pressure: 1020/1000
start: 12:52:24
Stop: 13:16:32

Down scale factor during test run
= 1000
