EXP1803 - Developing #197

Developing # 196 (Открыта): Post-production measurements

Measurement of thickness of thin silicon detector

05/24/2018 05:07 PM - Vratislav Chudoba

Status:	Открыта	**Start date:**	05/24/2018
Priority:	Низкий	**Due date:**	
Assignee:	Vratislav Chudoba	**% Done:**	0%
Category:	Measurement	**Estimated time:**	0.00 hour
Target version:			

Description

We need to determine thickness of the thin (assumed thickness ~20 mcm) silicon detector. It is very probable that we will deal with inhomogeneity of its thickness.

We will use the geometry of the left telescope as used in the course of the experiment ("20 mcm" detector + 1 mm silicon detector "4-1") with some modifications:

1. To increase energy determination accuracy, range provided by ADC will be reduced.
2. Detectors will be very close to each other to avoid alpha trajectory deflection when exiting the thin detector.
3. We will use two triggers: amplitude from the thin detector OR amplitude from thick detector.

Both detectors from the left telescope need to be calibrated for new amplifier gains.

History

#1 - 06/01/2018 10:37 AM - Ivan Muzalevsky

Several measurements were carried out. In all of them two detectors were used. 20 mcm (discription see in file 7306 rev 1 W1 ss 20 ceramic.pdf) and 1 mm Si detector number 4-1 (LEFT). Width of the sensitive part of 20 mcm and 1 mm det was 50x50 mm and 58x58 mm respectively.
Detector planes were parallel to each other. The distance between them was about 10.5 mm. Detectors were placed so that their centers were roughly opposite to each other. That means that 20 mkm det overlapped the 1 mm one.
Strips of 20 mcm had vertical orientation. Data from this strips was writted into the branch SQY_R[16] or the go4-file.
Front side of 1mm detector had 16 horizontal strips (Y track in go4-file). Data was written into the branch SQY_L[16].
Back side of 1 mm det - 32 vertical strips (X track in go4-file). Data was written into the branch SQX_L[32].

Two triggers from thick and thin detectors were used in a mode "OR". In out file one may find that trigger=2 for 20mcm and trigger=3 for 1mm detector.

- 20 mkm detector in green frame
- 1mm detector in orange one

det45pic.jpg

face.JPG

Three measurements were carried out, in all of them Ra226 were used as a source. The source was located on the height which roughly corresponds to the height of the detector centers heights. In all measurements source plane was faced to the center of the 1 mm detector and the distance between them was 35±1 cm.

- The angle between the alpha-particle trajectories, penetrated into the center of 1mm detector, and detector planes was about 90±3 deg. (Left scheme)
  data was written into: 159.93.80.161:/LynxOS/mbsusr/mbsdaq/mbsrun/exp201804/data/calib/si_after/si-1_si-20_35cm_0deg_new1_*.lmd
- alpha source was moved to moved to the right. The angle discribed above was 45±3 deg. (middle scheme)
  data was written into: 159.93.80.161:/LynxOS/mbsusr/mbsdaq/mbsrun/exp201804/data/calib/si_after/si-1_si-20_35cm_45deg_new1_*.lmd
- alpha source was moved to moved to the left. The angle discribed above was 60±3 deg. (right scheme)
  data was written into: 159.93.80.161:/LynxOS/mbsusr/mbsdaq/mbsrun/exp201804/data/calib/si_after/si-1_si-20_35cm_60deg_*.lmd

scheme1.png

#2 - 06/01/2018 10:41 AM - Vratislav Chudoba

- File 7306 rev 1 W1 ss 20 ceramic.pdf added

Files

7306 rev 1 W1 ss 20 ceramic.pdf	647 KB	06/01/2018	Vratislav Chudoba