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 Logbook of LEM Experiment in muE4 | Logged in as "LEM DAQ account" | **ELOG**

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Message ID: **4989** Entry time: **Mon Jul 25 09:45:07 2011**

Run:	1940
Author:	TP,ES
Type:	Info
System:	General
Subject:	LEM setup after warmup, MCP2 and Ag sample plate

Mon Jul 25 09:43:45 2011

- MCP2 mounted since yesterday morning, see previous elog;
 p_SCGJ = 2*10⁻⁷ mbar (BPVY closed)
 p_SCGJ = 2*10⁻⁸ mbar (BPVY open)
- Started slow control frontend, changed heater cable from low Temp to Konti
- degauss bruker
- APD's on
- TD on (-3.73/-3.54/-3.95/-3.35) kV
- PosMCP1_I and PosMCP1_O on (-1.87/-1.75) kV
- MCP2 on (-2.3/+0.4) kV
- MCP1 on, +2.6 kV
- new Ar/N2 moderator, 238/14 AA
- L2: I=6-7uA at 6kV
- changed to Event_1, enabled TOFAnaModule in analyzer, restarted analyzer
- after warmup: frequent discharges at moderator with beam; needs conditioning and new moderator layer.

L2 6kV: current now ~7uA.

We probably have to lower soon to 4kV. At 14/15/18kV transport, about 5/5/2% loss in event rate. At lower transport losses increase to about 10% at 10kV.

New parameters:

Voltage (kV)	RA-L (kV)	RA-R (kV)	RA-T (kV)	RA-B (kV)	MeanX/Y (L2=4kV,0G)	MeanX/Y (L2=6kV,0G)	MeanX/Y (L2=6kV,100G)
7.5	4.76	4.74	4.80	4.70	0.14/0.19	0.28/-0.27	0.47/-0.32
10	6.70	6.68	6.77	6.61	-0.09/0.05	-0.18/-0.037	0.31/-0.58
11	7.47	7.45	7.55	7.37	-0.11/-0.02	-0.05/-0.08	0.33/-0.59
12	8.25	8.23	8.34	8.14	-0.03/0.01	-0.02/0.02	0.33/-0.59
13.5	9.40	9.38	9.50	9.28	-0.07/0.05	0.01/0.01	0.41/-0.431
14	9.81	9.77	9.90	9.68	0.20/0.06		0.71/-0.48
15	10.56	10.56	10.67	10.45	0.08/-0.05	0.17/-0.01	
18	12.88	12.88	13.03	12.73	0.03/-0.03	0.02/0.02	0.5/-0.5

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- Unused recycled Ag/Al plate on Konti-2; see also [elog:LEM_Experiment/4934](#), Ag runs in April 2011
- Changed back to Event_2 (LE-muSR), disabled TOFAnaModule in analyzer, restarted analyzer
- plan: energy scan at 100G and 1kG; trying to optimize RA steering at B>500G

Energy scan at 50K, 100G:

Fig. 1: asymmetry
 Fig. 2: depolarization rate
 Fig. 3: alphaTB and alphaLR

The increase in alphaTB at lower implantation energies indicates a downward-moving beam spot (definition of alpha in the fits: N_B = alpha_TB * N_T). This seems to be reasonable since the beam arrives from the top with a downward velocity component (RA-TB steering of about +0.2 kV). alphaLR doesn't change, indicating that the beam doesn't move horizontally.

Fig. 4: Event rate at 1kG as a function of implantation energy, 12kV transport, RA=0.
 Run 2020: 2keV, rate begins to drop.

Run 2021: 1keV, **event rate decreased by ~15%**! This could be caused by the low-energy tail of the energy spectrum which is being reflected by the electric field in front of the sample. At a field of 100G these reflected muons probably stop in the radiation shield, whereas they are spiralling off from the sample region at 1kG.

Tue Jul 26 21:25:03 2011

At 200 K: 1kG and +3kV at sample doesn't work; too many ions...

I have to skip the energy scan at 200K/1kG. Go back to 100G.

Comparison of energy scans at 50K and 200K, 12kV transport, 100G

Fig. 5: asymmetry
 Fig. 6: depolarization rate

Fig. 7: alphaTB and alphaLR

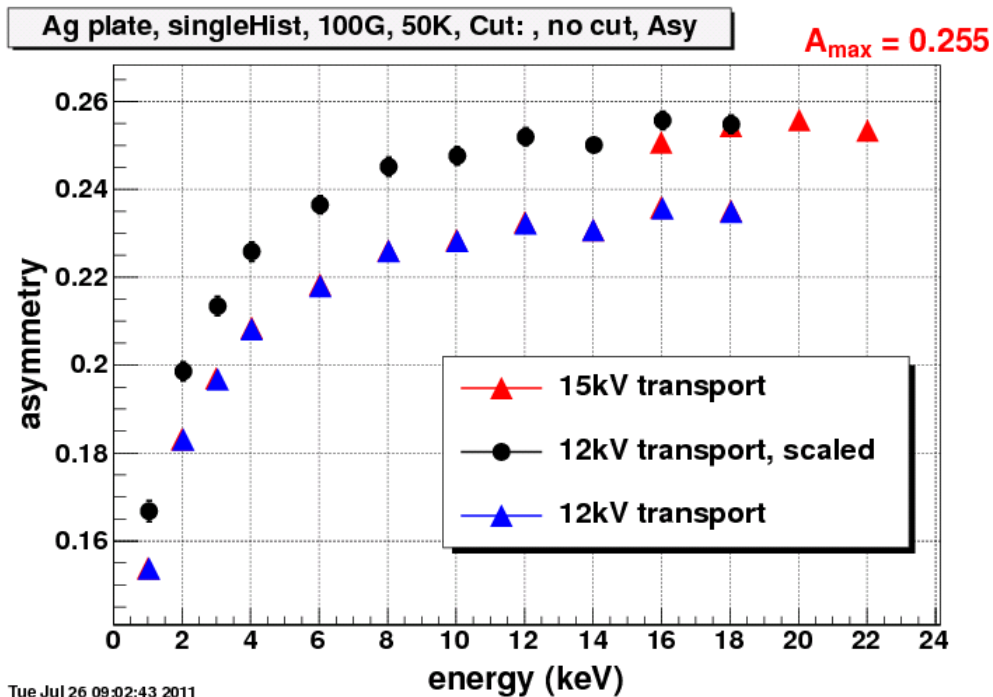
Asymmetry is slightly higher at 200 K, except at 1 keV: there is a much larger relative increase in asymmetry compared to other energies --> check fit ranges: no change in result when fitting from 0.25 to 10us instead of 0.05 to 10 us; the spectra at 1 keV are distorted in the first 100 ns.

Comparison of energy scans at 100G and 1kG, 50K, 12kV transport:

- Fig. 8: asymmetry
- Fig. 9: depolarization rate
- Fig. 10: alphaTB and alphaLR

At 1kG, RA = 0; due to missing steering the beam spot doesn't move anymore as a function of energy at 1kG (alpha's don't change, see Fig. 10).

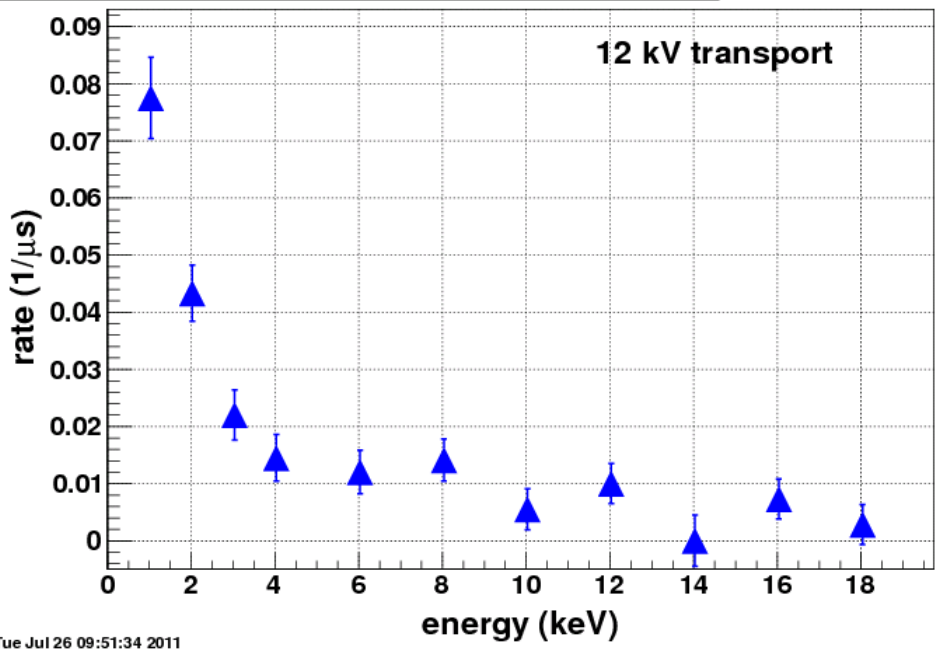
Attachment 1: [Ag_50K_100G_Escan.png](#) 38 kB Uploaded Tue Jul 26 10:03:56 2011 | [Hide](#) | [Hide all](#)



Tue Jul 26 09:02:43 2011

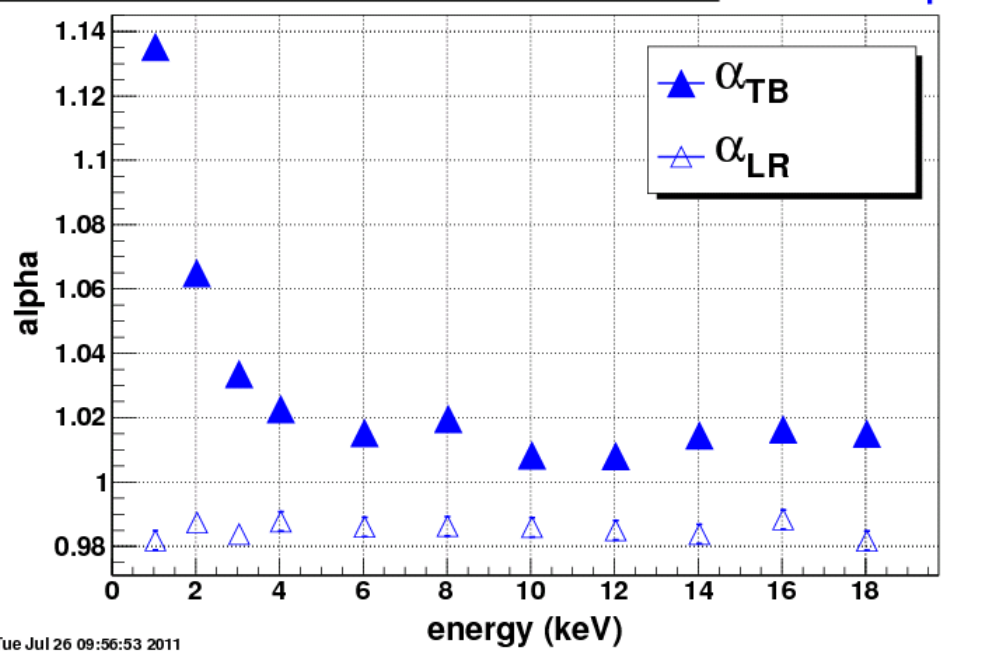
Attachment 2: [Ag_50K_100G_Escan_Rate.png](#) 38 kB Uploaded Tue Jul 26 10:58:55 2011 | [Hide](#) | [Hide all](#)

Ag plate, singleHist, 100G, 50K, Cut: Data.dataTr>11.9&&Data.dataTr<12.1, Rate

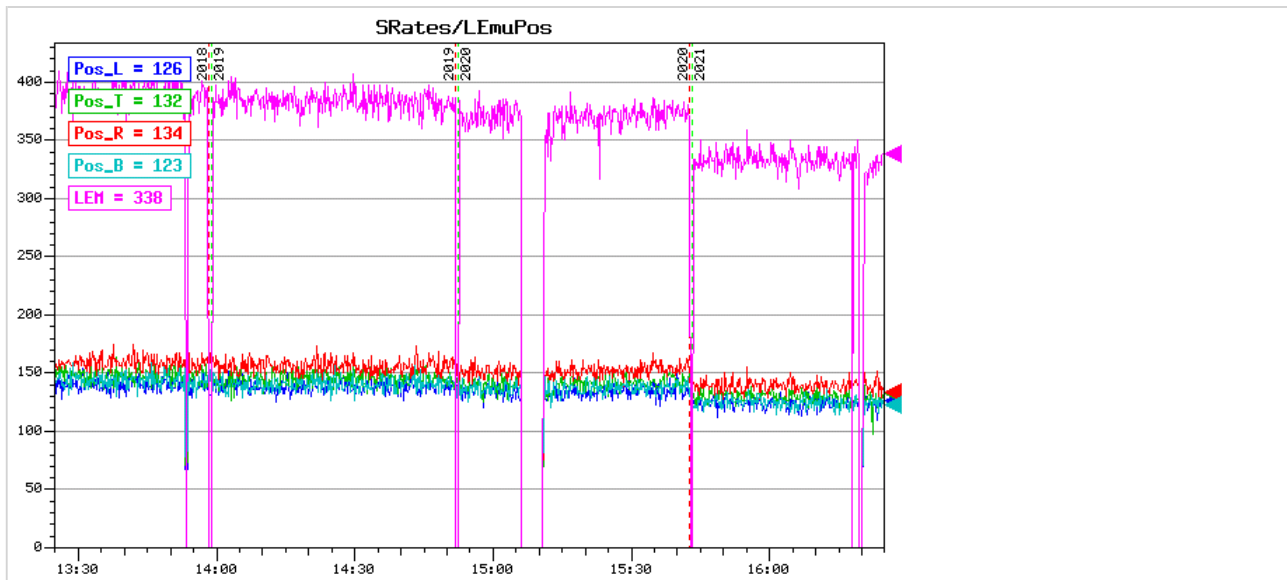


Attachment 3: [Ag_50K_100G_Escan_Alpha.png](#) 34 kB Uploaded Tue Jul 26 10:59:04 2011 | [Hide](#) | [Hide all](#)

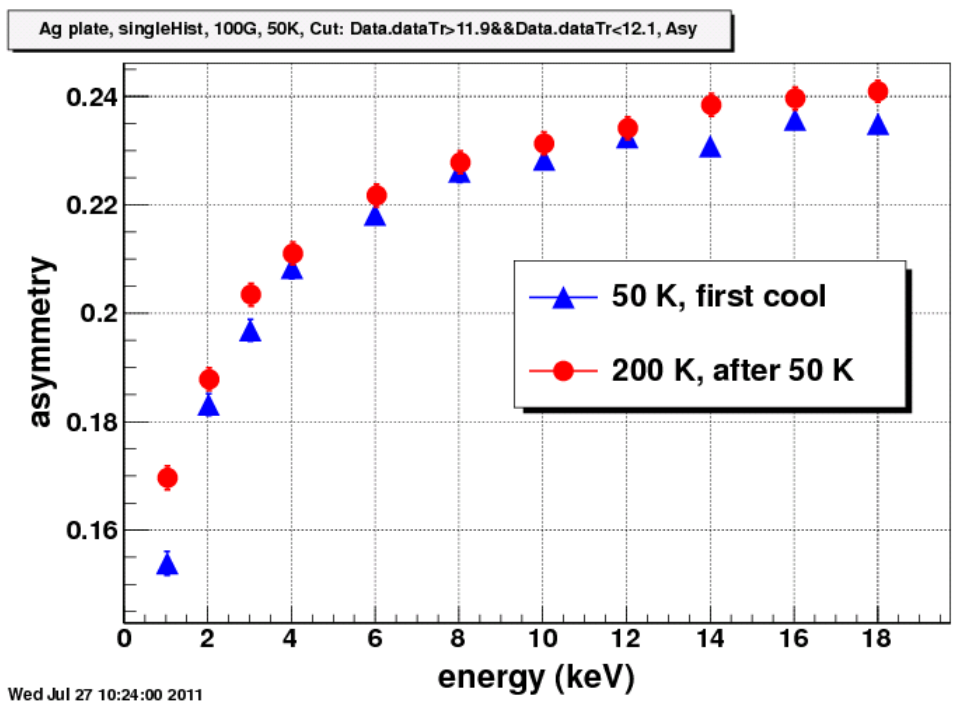
Ag plate, singleHist, 100G, 50K, Cut: Data.dataTr>11.9&&Data.dataTr<12.1, Alpha_TB



Attachment 4: [LEmuPos.gif](#) 16 kB Uploaded Tue Jul 26 17:26:04 2011 | [Hide](#) | [Hide all](#)



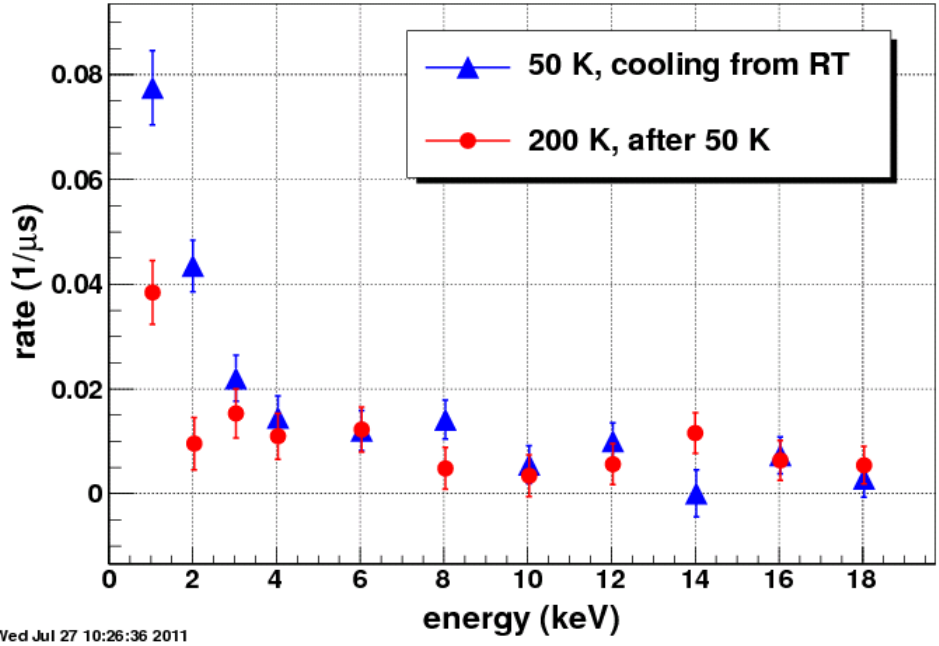
Attachment 5: [Ag_50-200K_12kV_100G_Escan_Asym.png](#) 32 kB Uploaded Wed Jul 27 11:37:31 2011 | [Hide](#) | [Hide all](#)



Wed Jul 27 10:24:00 2011

Attachment 6: [Ag_50-200K_12kV_100G_Escan_Rate.png](#) 33 kB Uploaded Wed Jul 27 11:37:40 2011 | [Hide](#) | [Hide all](#)

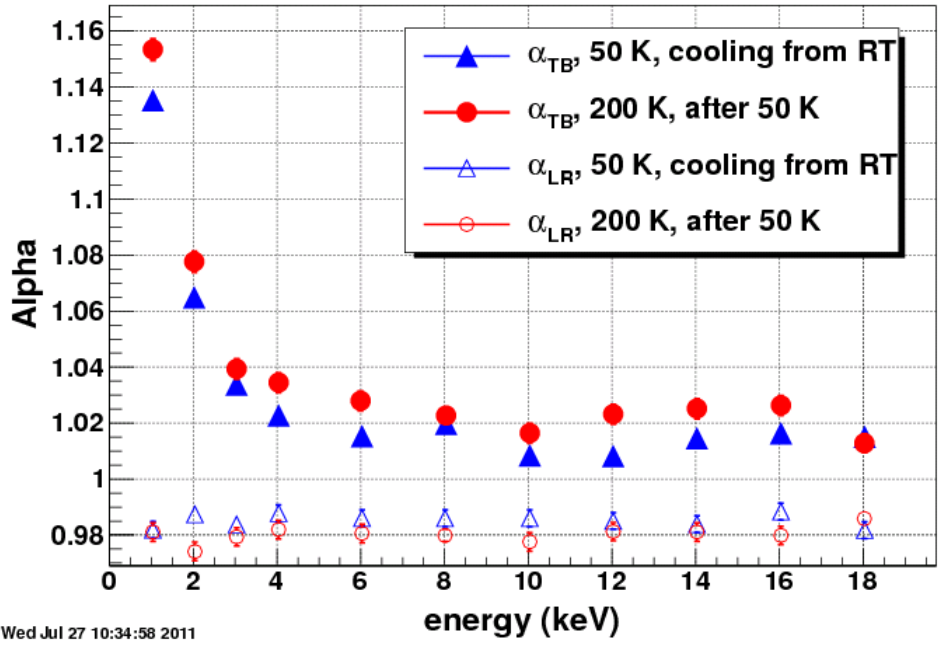
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Wed Jul 27 10:26:36 2011

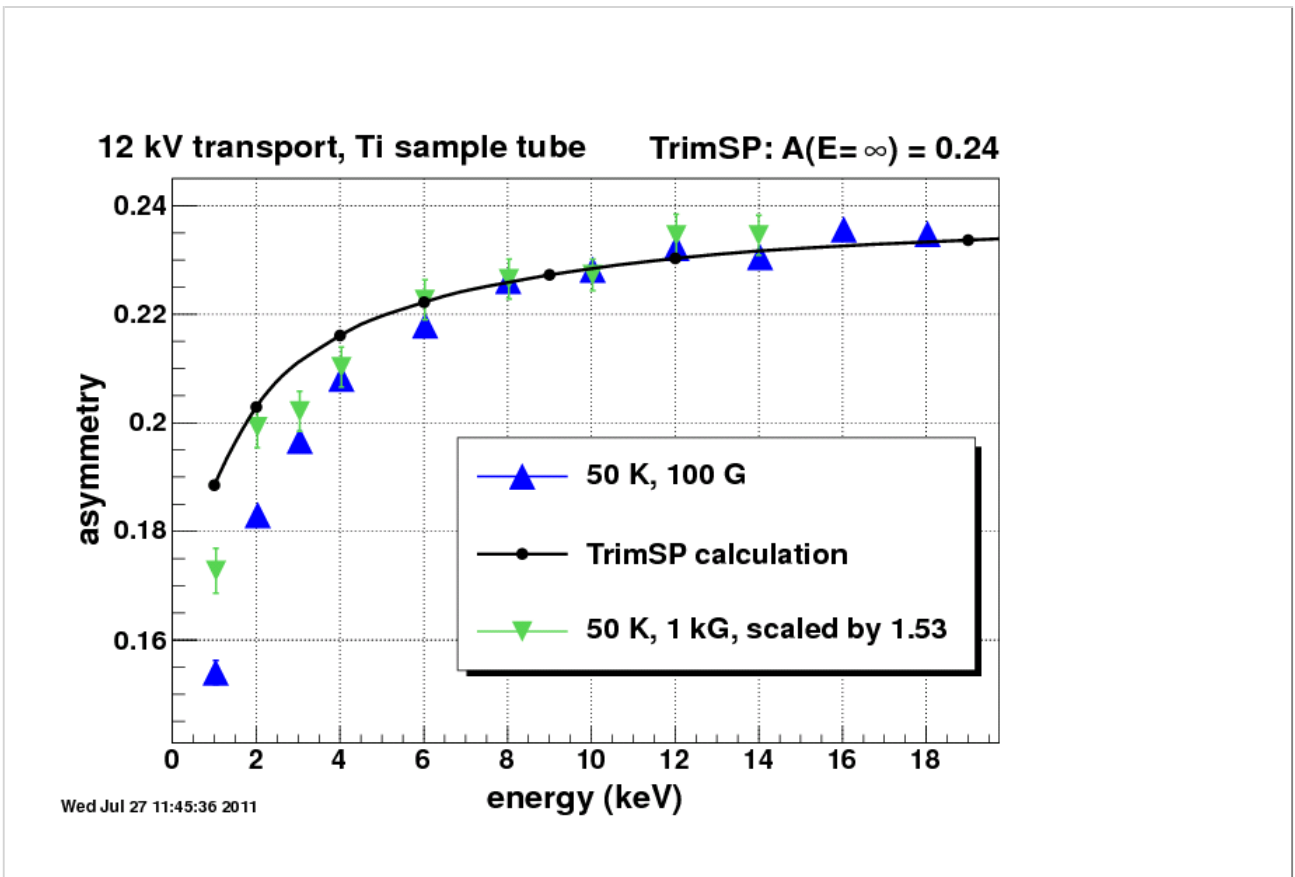
Attachment 7: Ag_50-200K_12kv_100G_Escan_Alpha.png 42 kB Uploaded Wed Jul 27 11:38:07 2011 | Hide | Hide all

Ag plate, singleHist, 100G, 50K, Cut: Data.dataTr>11.9&&Data.dataTr<12.1, Alpha_TB

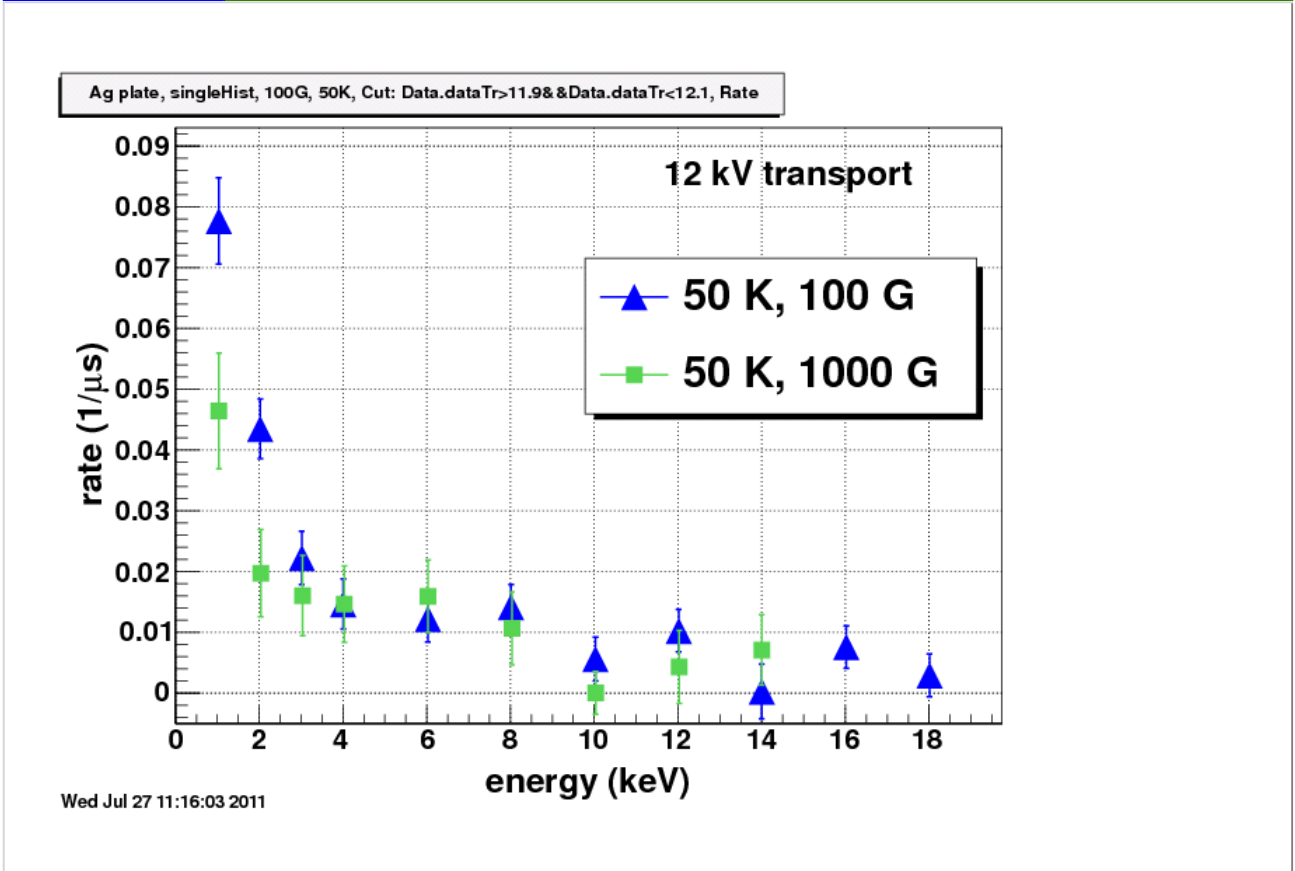


Wed Jul 27 10:34:58 2011

Attachment 8: Ag_50K_100-1000G_Escan_Asym_TrimSP.png 37 kB Uploaded Wed Jul 27 12:46:04 2011 | Hide | Hide all



Attachment 9: [Ag_50K_100-1000G_Escan_Rate.png](#) 40 kB Uploaded Wed Jul 27 12:46:15 2011 | [Hide](#) | [Hide all](#)



Attachment 10: [Ag_50K_100-1000G_Escan_Alpha.png](#) 48 kB Uploaded Wed Jul 27 12:46:25 2011 | [Hide](#) | [Hide all](#)

