

Message ID: 4324 Entry time: **Mon Aug 11 16:37:41 2008**

Run:	1457
Author:	TP
Type:	Info
System:	General
Subject:	Results of 8-mm Ag-on-Ni

LEM default transport, 15kV, sample 0, 100GTF Bpar:

- Figure 1-3: RA-LR scan, RAT-RAB=0: max. asymmetry ~ 0.081 (was 0.113 for small sample setup, see [elog:LEM_Experiment/4261](#))
- Figure 4: RA-TB scan at RAL-RAR=-0.2kV. Max. asymmetry 0.085 at RAT-RAB=0.1.
- Figure 5: RA-TB scan at RAL-RAR=-0.25kV. Max. asymmetry 0.086 at RAT-RAB=0.1

Mon Aug 11 22:30 2008:

Change to "Small sample transport" (L2=15kV, L3=8.5kV, RA-Mean=11.0 kV) and do RA scans over night.

Tue Aug 12 08:30 2008:

Preliminary "small-sample-transport" result: max. asymmetry 0.115 (compared to 0.156 for small sample setup, see [elog:LEM_Experiment/4261](#)). "Small-sample-setup" has ~ 1.35 times higher asymmetry, either for "small-sample-transport" or "default-transport" settings.

Best RA settings: RAL-RAR = -0.3kV, RAT-RAB = 0.1kV, 0 kV at sample.

See Figure 6 for preliminary plot.

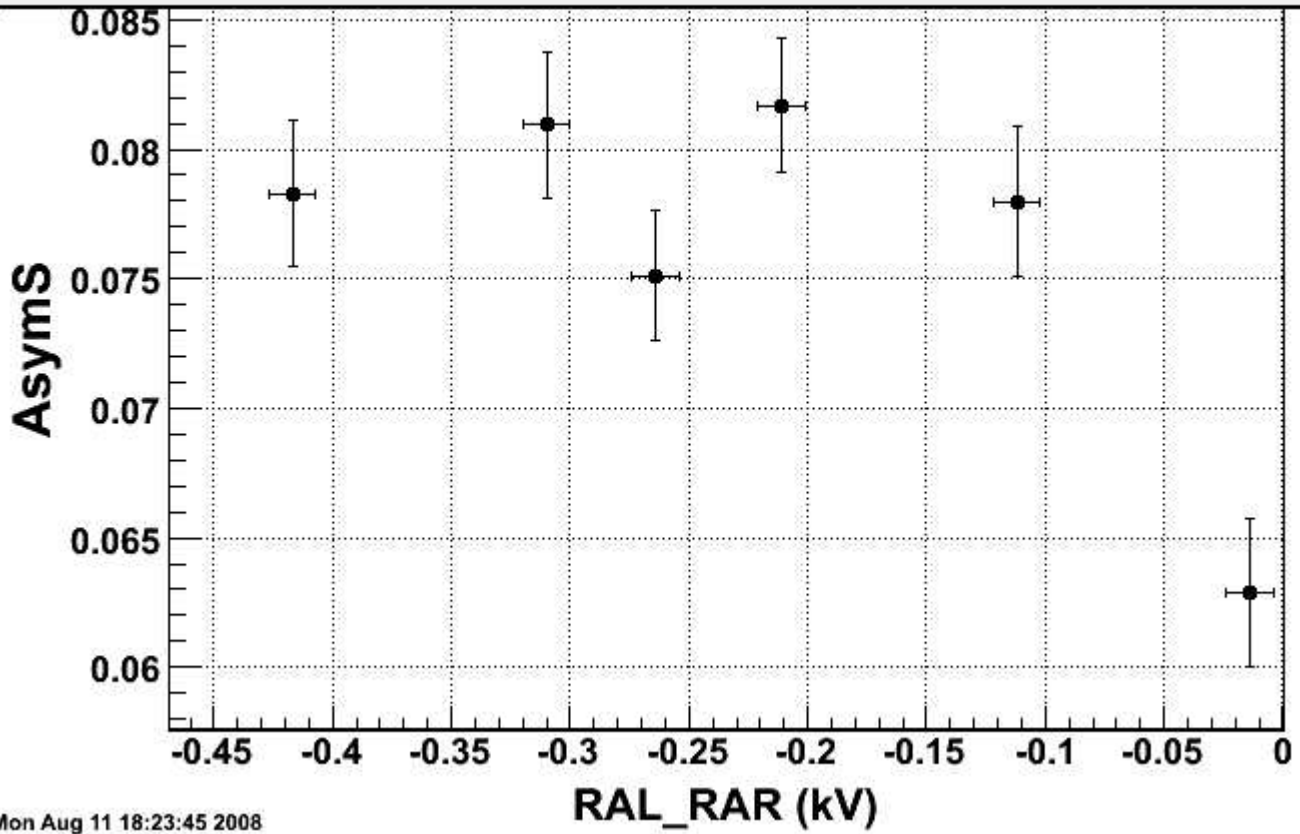
Energy scan at RAL-RAR = -0.3kV, RAT-RAB = 0.1 kV:

- 3.0 keV: A = 0.057(3); A = 0.062(3) for RAL-RAR = -0.4kV
- 5.0 keV: A = 0.070(2)
Compare with SmallSampleSetup (Konti-3, June 2008 measurements): here, problem with large background in R detector, depending on steering; therefore, one has to consider the "mean" asymmetry of L+R detectors; best online fits results:
run 1057 (rel.Asy of R = 1.03): meanAsy = 0.066(3)
run 1059 (rel.Asy of R = 0.72): meanAsy = 0.069(3)
run 1065 (rel.Asy of R = 0.62): meanAsy = 0.068(4).
This suggests that for large decelerating fields (low implantation energies) the normal setup with large plates is of advantage. It avoids the problems of different asymmetries and - on first view with WKM FFT - does not show the broad background around 30 G.
- 7.0 keV: A = 0.079(3)
- 10.0 keV: A = 0.096(3); Konti-3: 0.129(3)
- 14.1 keV: A = 0.115(2); Konti-3: 0.156(3)

Attachment 1:

[Default_Transport_RA-LR_scan.png](#) 15 kB Uploaded Mon Aug 11 19:28:15 2008
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Ag 8mmdiameter on Ni plate, T=20K, Bpar~95G, RA scan, Cut: , no cut, AsymS

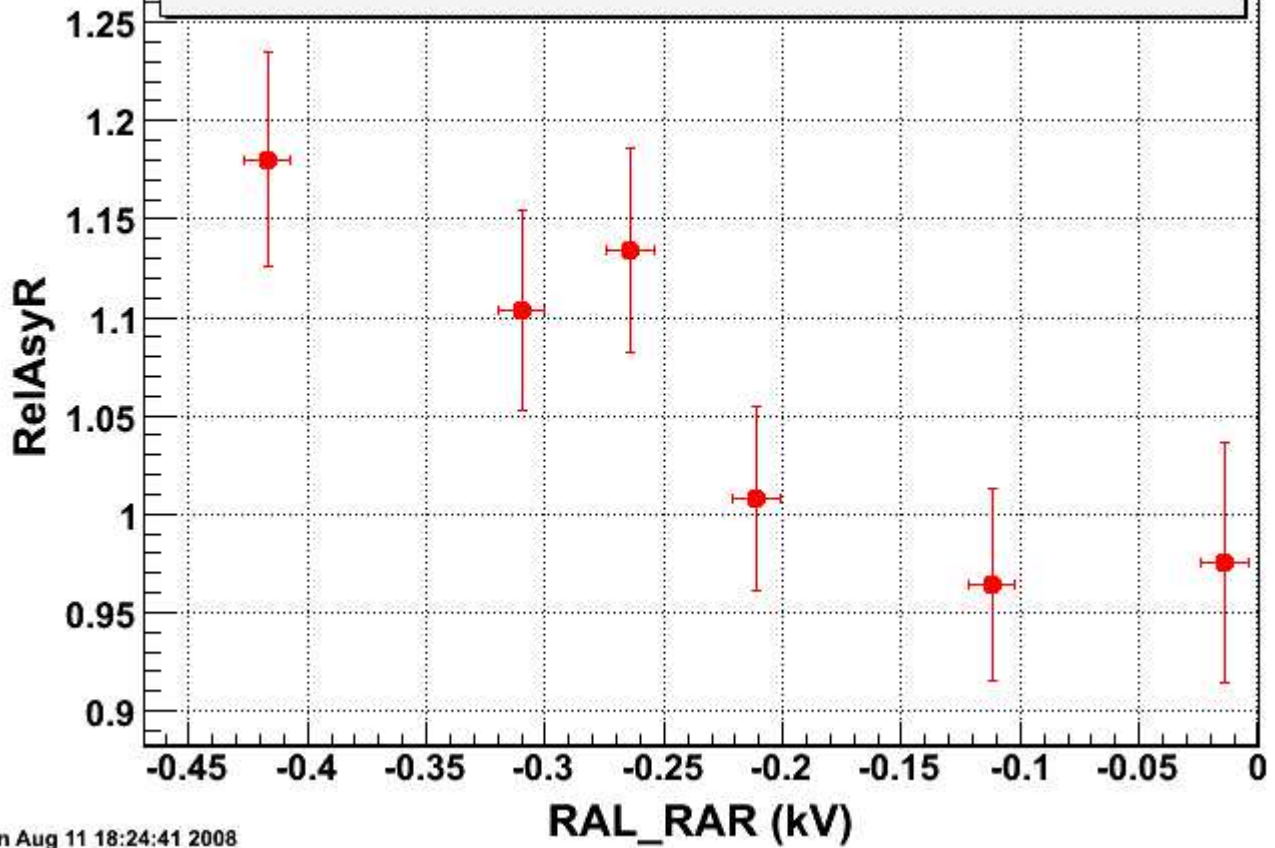


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Attachment 2:

[Default_Transport_RA-LR_scan_RelAsy.png](#) 14 kB Uploaded Mon Aug 11 19:28:29 2008
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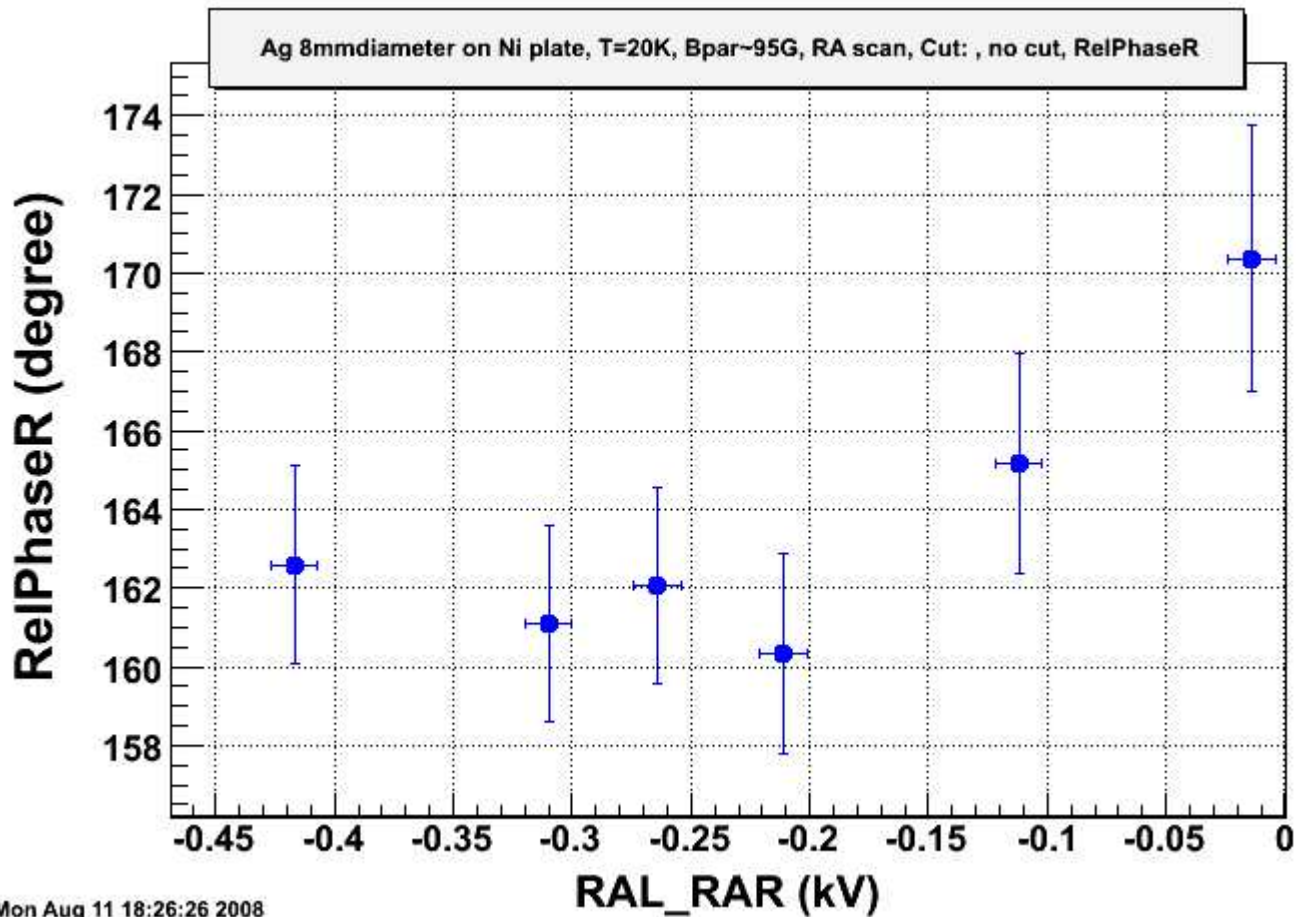
Ag 8mmdiameter on Ni plate, T=20K, Bpar~95G, RA scan, Cut: , no cut, RelAsyR



Mon Aug 11 18:24:41 2008

Attachment 3:

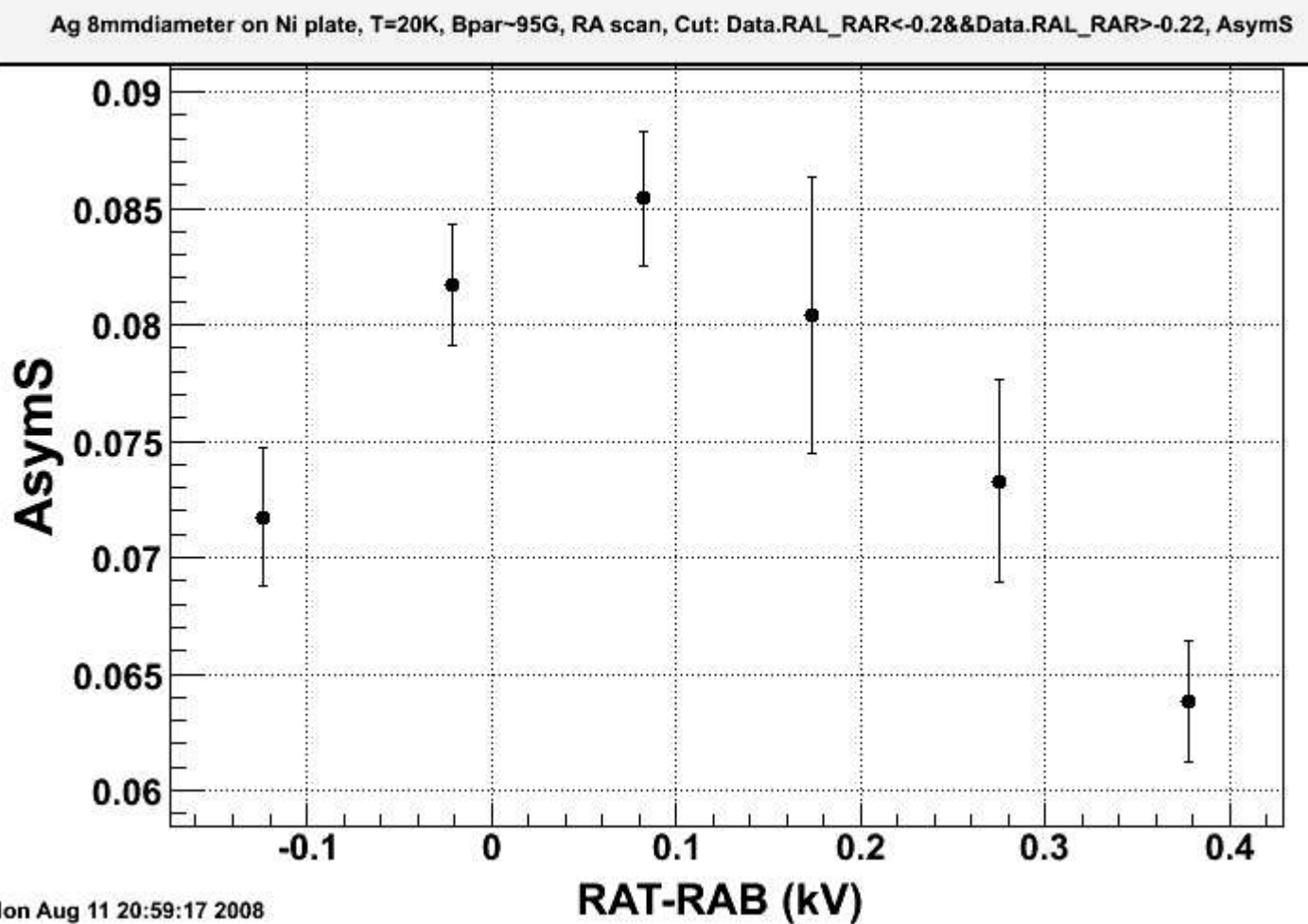
[Default_Transport_RA-LR_scan_RelPhase.png](#) 16 kB Uploaded Mon Aug 11 19:28:42 2008
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Mon Aug 11 18:26:26 2008

Attachment 4:

[Default_Transport_RA-TB_scan_RALR-0-2_Asy.png](#) 15 kB Uploaded Mon Aug 11 22:00:56 2008 | [Hide](#) | [Hide all](#)

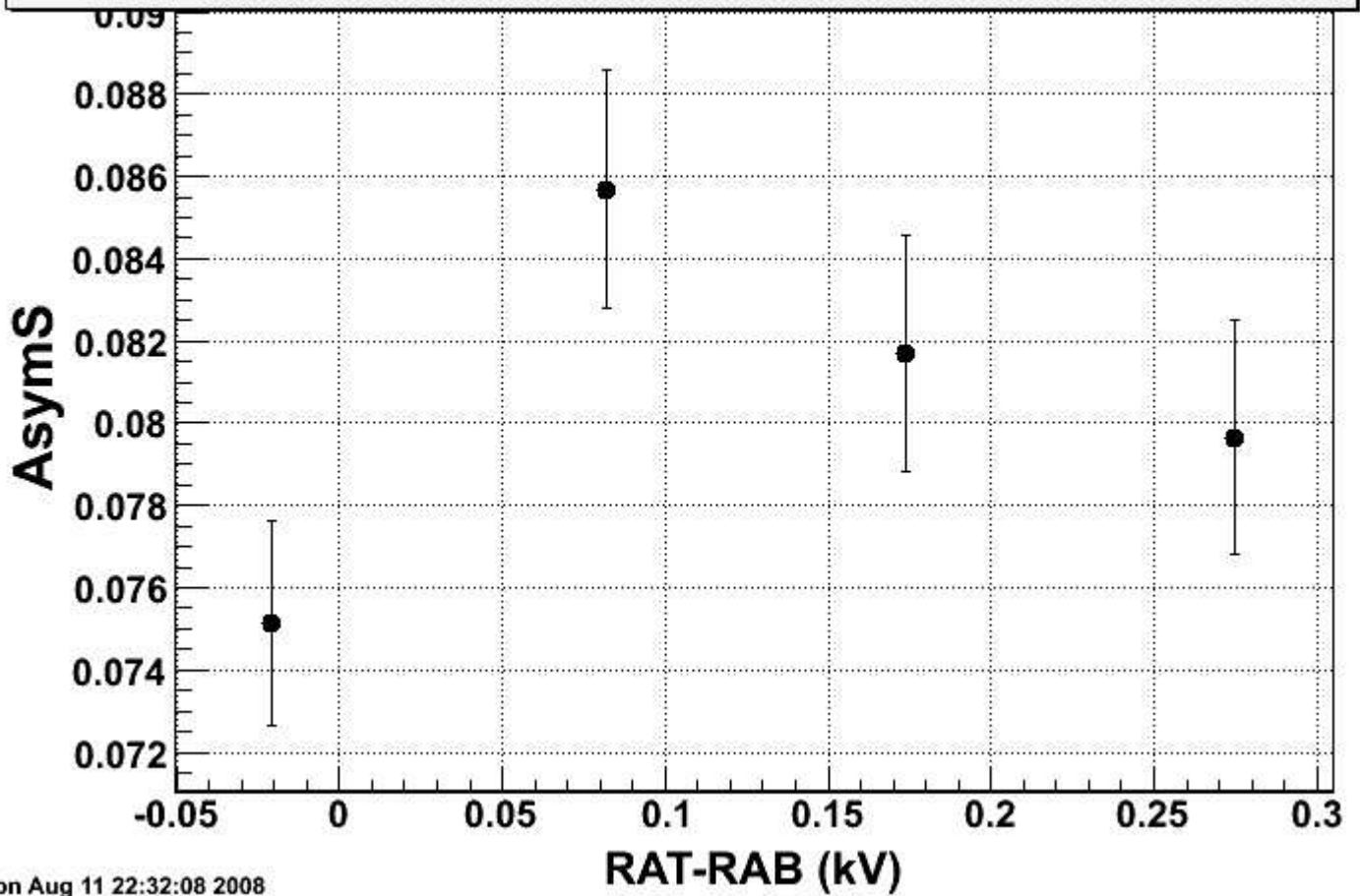


Mon Aug 11 20:59:17 2008

Attachment 5:

[Default_Transport_RA-TB_scan_RALR-0-25_Asy.png](#) 16 kB Uploaded Mon Aug 11 23:32:58 2008 | [Hide](#) | [Hide all](#)

Ag-8mm diameter on Ni plate, T=20K, Bpar=95G, RA scan, Cut: Data.RAL_RAR<-0.25&&Data.RAL_RAR>-0.27, AsymS

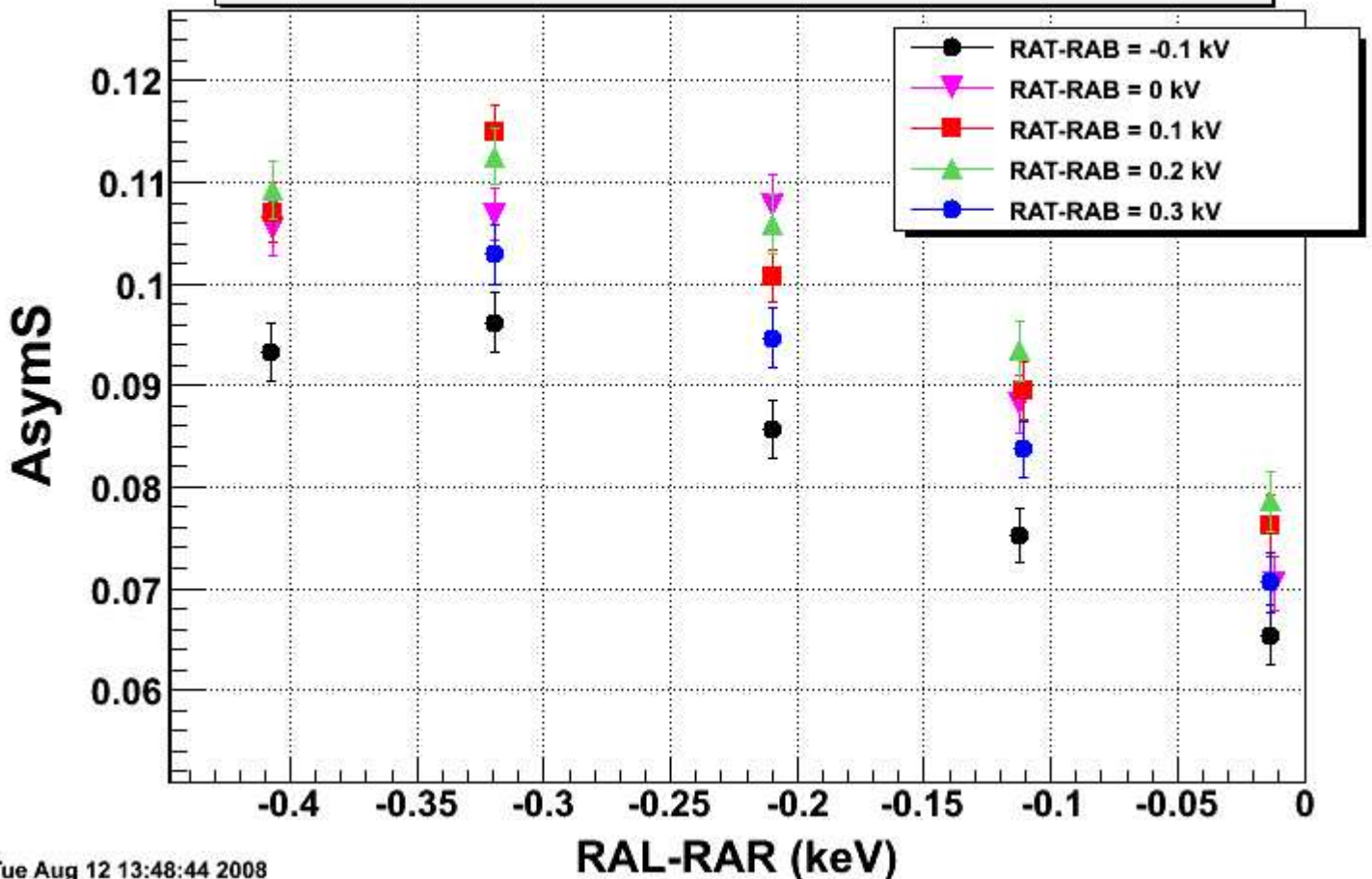


Mon Aug 11 22:32:08 2008

Attachment 6:

[SmallSample_Transport_RAscans.png](#) 19 kB Uploaded Tue Aug 12 14:50:46 2008
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Ag-8mm diameter on Ni plate, T=20K, Bpar=95G, RA scan, Cut: Data.RAT_RAB>-0.15&&Data.RAT_RAB<-0.05, AsymS



Tue Aug 12 13:48:44 2008

 **Wed Aug 13 10:18:45 2008, 1524, TP, Info, General, Results of 10x10-mm² Ag-on-Ni**

 [Sat Aug 16 10:30:11 2008, 1524, TP, Info, General, Results of 10x10-mm² Ag-on-Ni](#)

Message ID: 4326 Entry time: **Wed Aug 13 10:18:45 2008** Reply to this: **4328**

Run:	1524
Author:	TP
Type:	Info
System:	General
Subject:	Results of 10x10-mm ² Ag-on-Ni

Field and temperature: Bpar 100 G, 20 K.

15kV "default" LEM transport (L2=13kV, L3=8.352kV, RA-mean=10.56kV):
 RA scans at 0 sample potential, 14.1 keV implantation energy.

Max. asymmetry, "default" transport 15kV settings:

- 20.0 keV: 0.160(3) for RAL-RAR = -0.2 kV, RAT-RAB = 0.2 kV.
- 14.1 keV: 0.132(2) for RAL-RAR = -0.3 kV, RAT-RAB = 0.2 kV.
 This is about 50 % of the max. asymmetry, in agreement with MCP2 beam spot measurements.
 Fit gauss to RAL-RAR scan: optimum at RAL-RAR = -0.29(3) kV.
 Figure 1.
- 10.0 keV: 0.114(3) for RAL-RAR = -0.2 kV, RAT-RAB = 0.1 kV.
- 6.0 keV: 0.089(3) for RAL-RAR = -0.2 kV, RAT-RAB = 0.1 kV.
- 4.0 keV: 0.076(3) for RAL-RAR = -0.3 kV, RAT-RAB = 0.1 kV.
- 2.0 keV: 0.067(4) for RAL-RAR = -0.4 kV, RAT-RAB = 0.1 kV.
 Fit gauss to RAL-RAR scan: optimum at RAL-RAR = -0.39(3) kV.
 Figure 2.

Fit gaussians to RALR scans to obtain best values to optimum RAL-RAR difference and max. asymmetry, see Figure 4:

Energy	RAL-RAR	Default transport Asymmetry
20 keV	-252(39) V	0.156(2)
14.1 keV	-288(28) V	0.133(2)
10 keV	-243(36) V	0.112(2)
6 keV	-265(40) V	0.087(2)
4 keV	-330(32) V	0.074(2)
2 keV	-394(76) V	0.065(2)

Max. asymmetry, "small-sample" transport 15kV settings:

- 20.0 keV: 0.171(3) for RAL-RAR = -0.3 kV, RAT-RAB = 0.1 kV.
- 14.1 keV: 0.152(3) for RAL-RAR = -0.3 kV, RAT-RAB = 0.1 kV.
 This is about 58% of max. asymmetry, close to the expectation of 60 % of MCP2 beam spot measurements.
 Figure 5.
- 10.0 keV: 0.131(3) for RAL-RAR = -0.4 kV!?, RAT-RAB = 0.1 kV.
- 6.0 keV: 0.113(3) for RAL-RAR = -0.4 kV!?, RAT-RAB = 0.1 kV.
- 4.0 keV: 0.099(3) for RAL-RAR = -0.3 kV, RAT-RAB = 0.1 kV.
- 2.0 keV: 0.080(3) for RAL-RAR = -0.3 kV, RAT-RAB = 0.1 kV.

Fit gaussians to RALR scans to obtain best values to optimum RAL-RAR difference and max. asymmetry, see Figure 6:

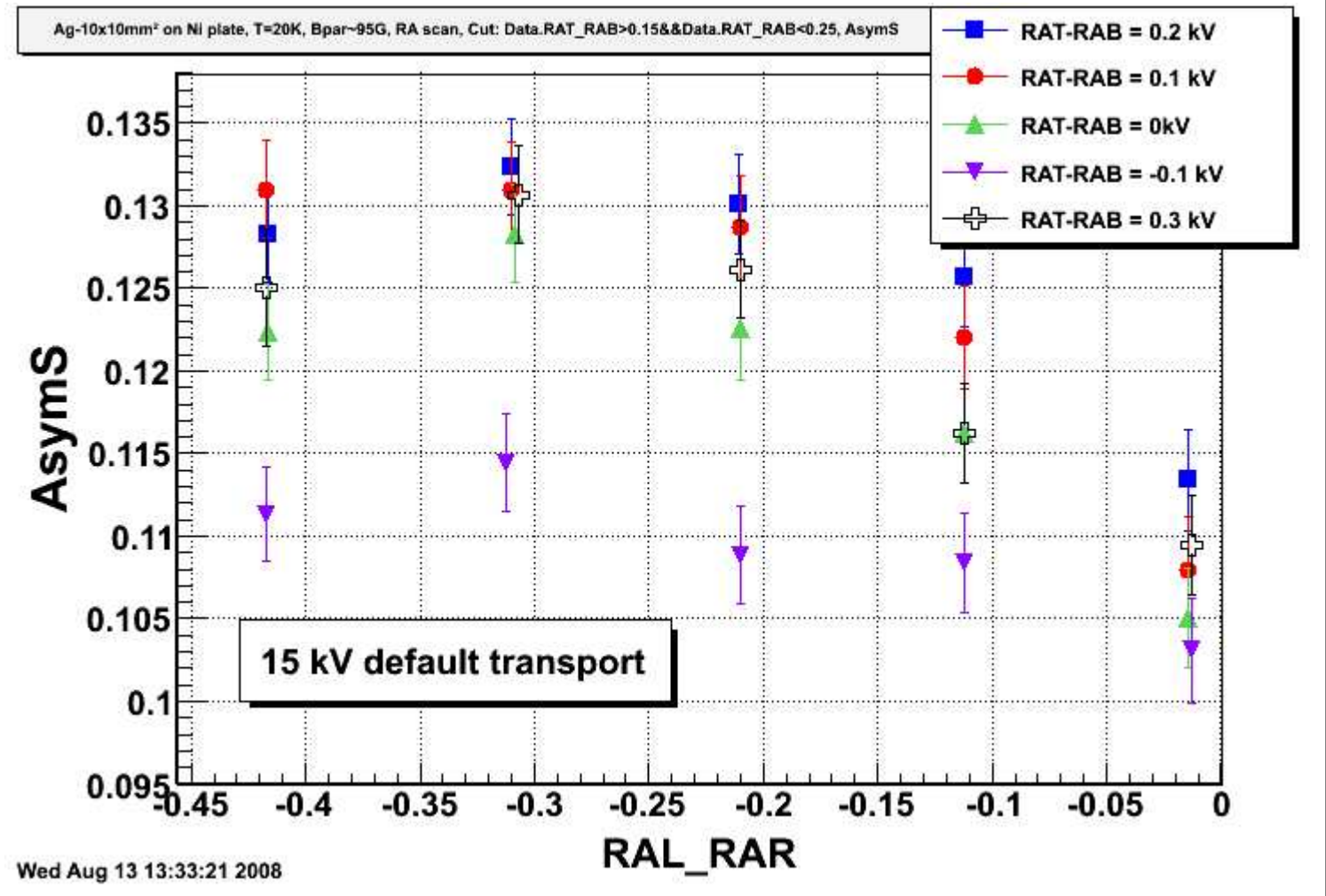
Energy	RAL-RAR	Asymmetry	Asym/Def.Asym
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20 keV	-332(16) V	0.167(2)	1.071(19)
14.1 keV	-318(12) V	0.153(2)	1.150(21)
10 keV	-312(20) V	0.129(2)	1.151(25)
6 keV	-348(18) V	0.110(2)	1.264(33)
4 keV	-337(17) V	0.097(2)	1.311(38)
2 keV	-285(29) V	0.080(2)	1.231(44)

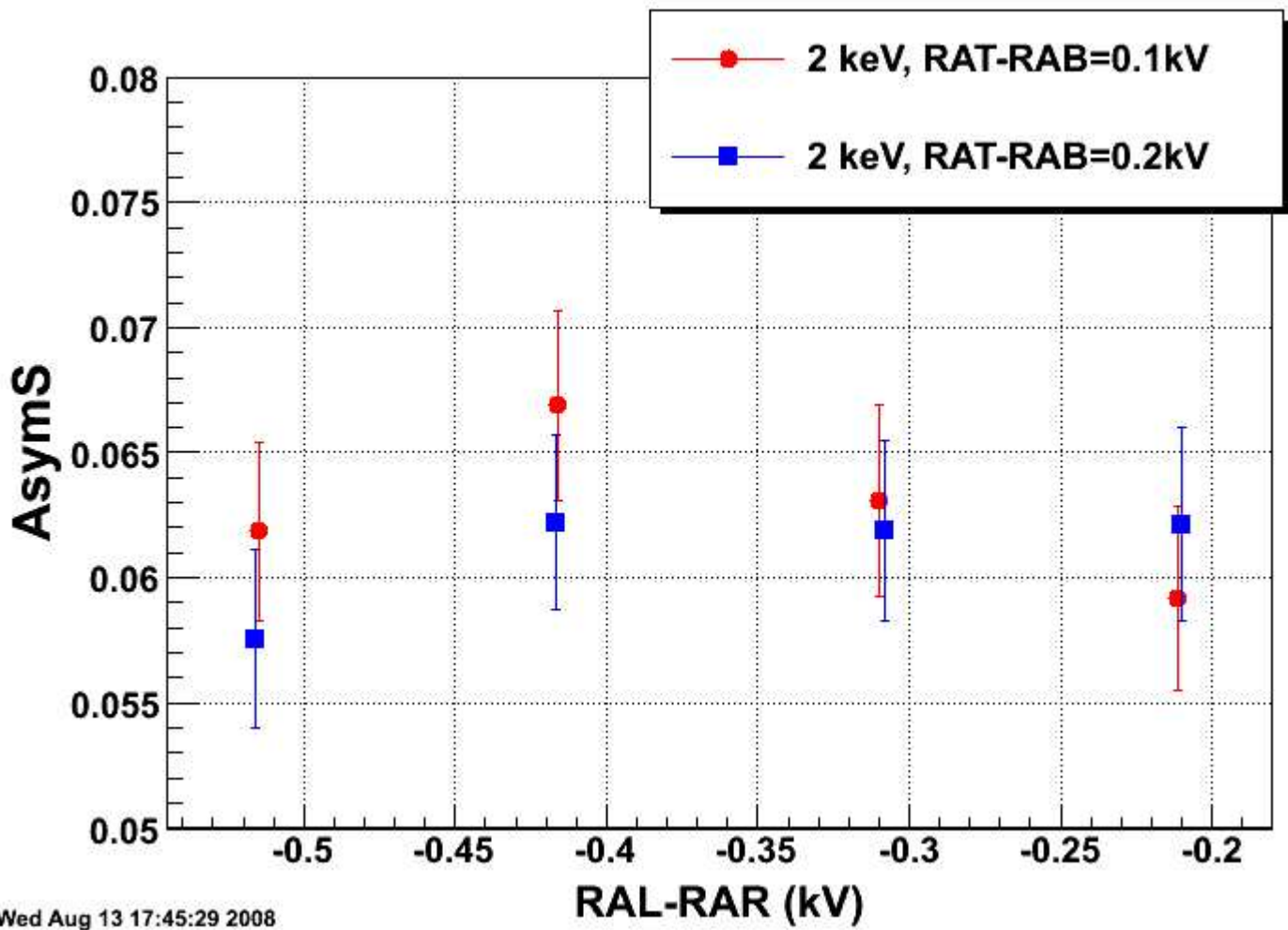
Advantages of small-sample transport settings compared to default transport settings:

- relative asymmetry increases for lower energies (< 10 keV), see table above.
- all energies could be done with one RAL-RAR steering.

Attachment 1: [Default_Transport_RAscan_14.1keV.png](#) 22 kB Uploaded Wed Aug 13 14:33:44 2008
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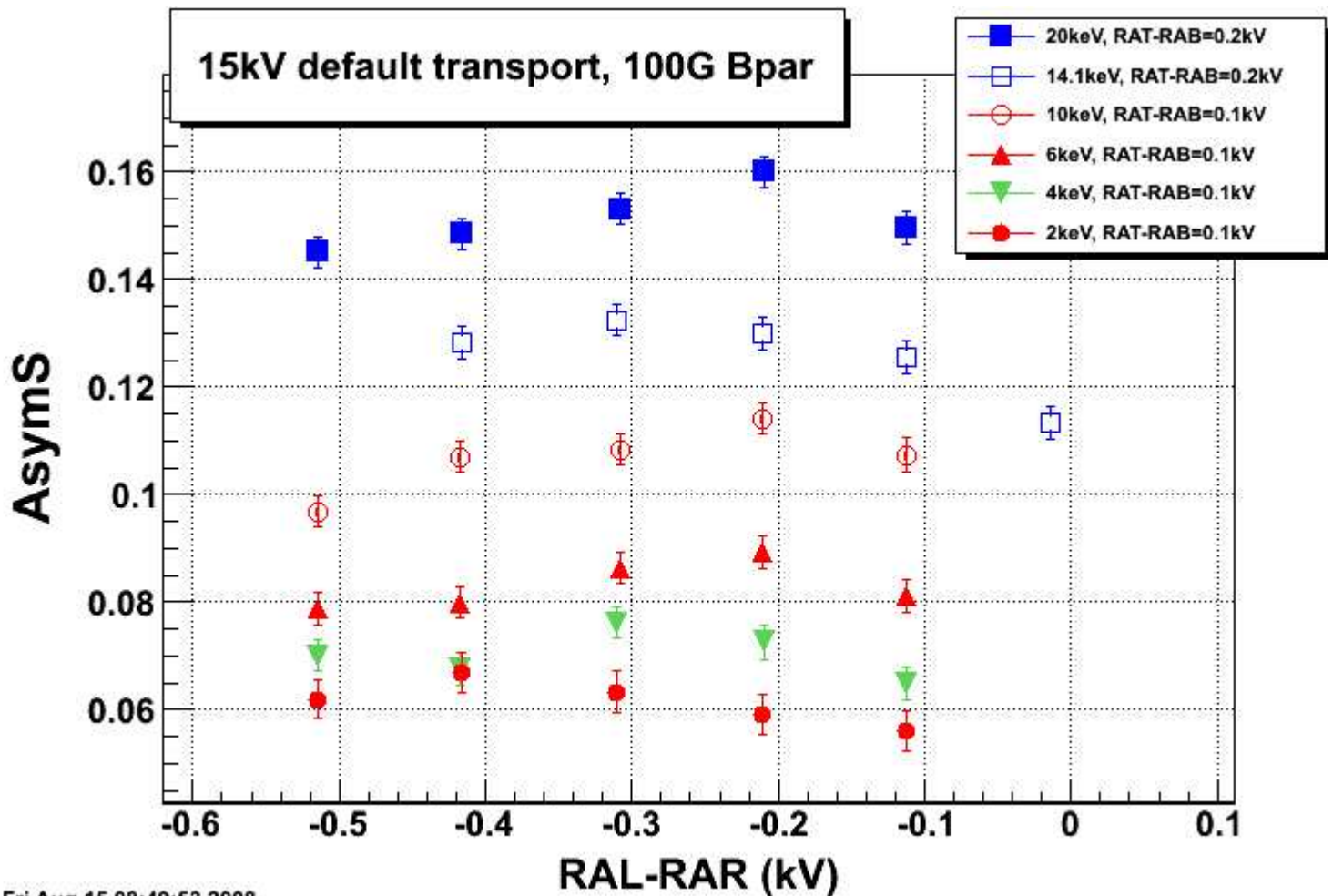


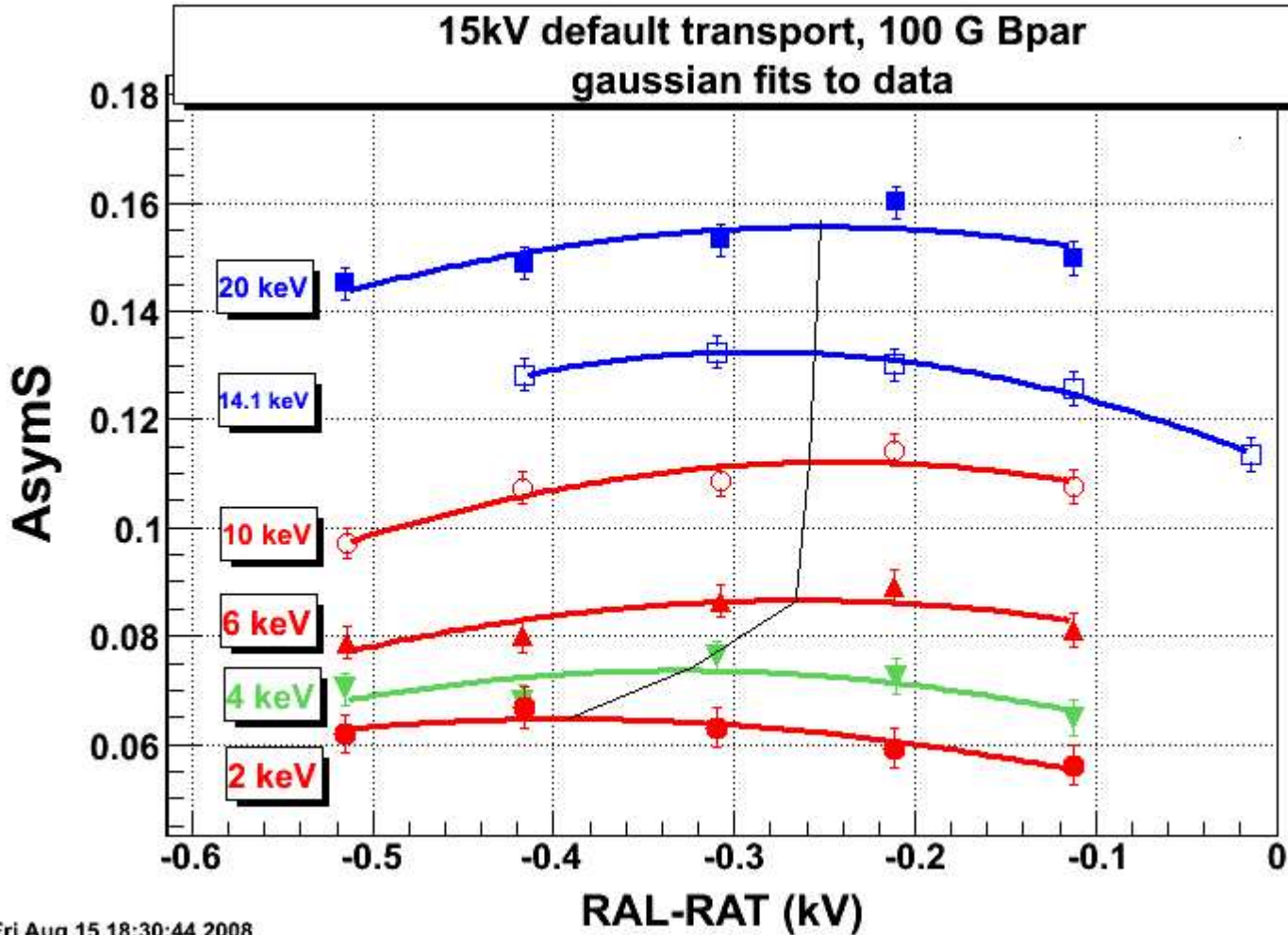
Attachment 2: [Default_Transport_RAscan_2keV.png](#) 15 kB Uploaded Wed Aug 13 18:45:52 2008
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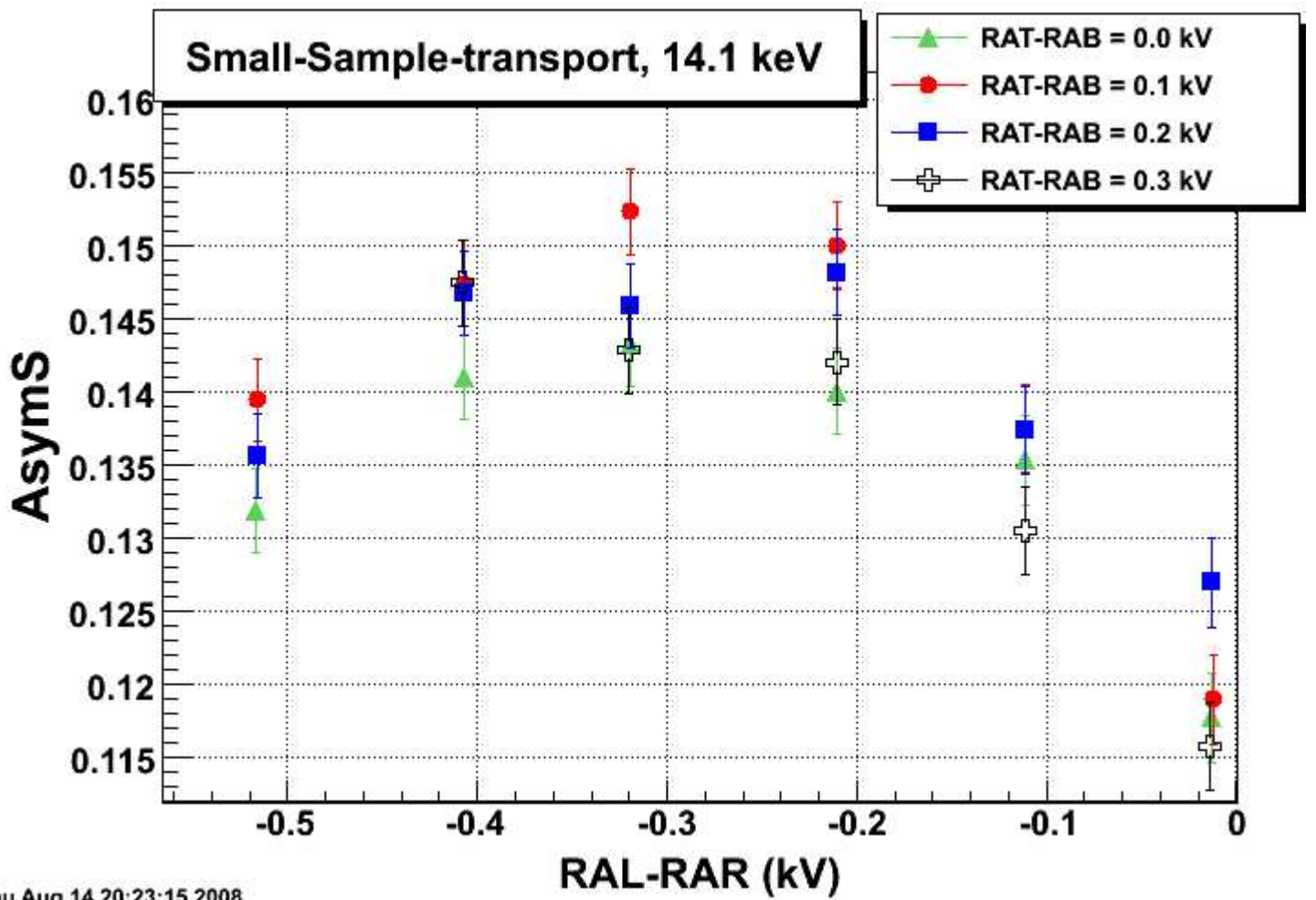
Attachment 3:

Default_Transport_RAscan_Escan.png 19 kB Uploaded Fri Aug 15 09:50:24 2008
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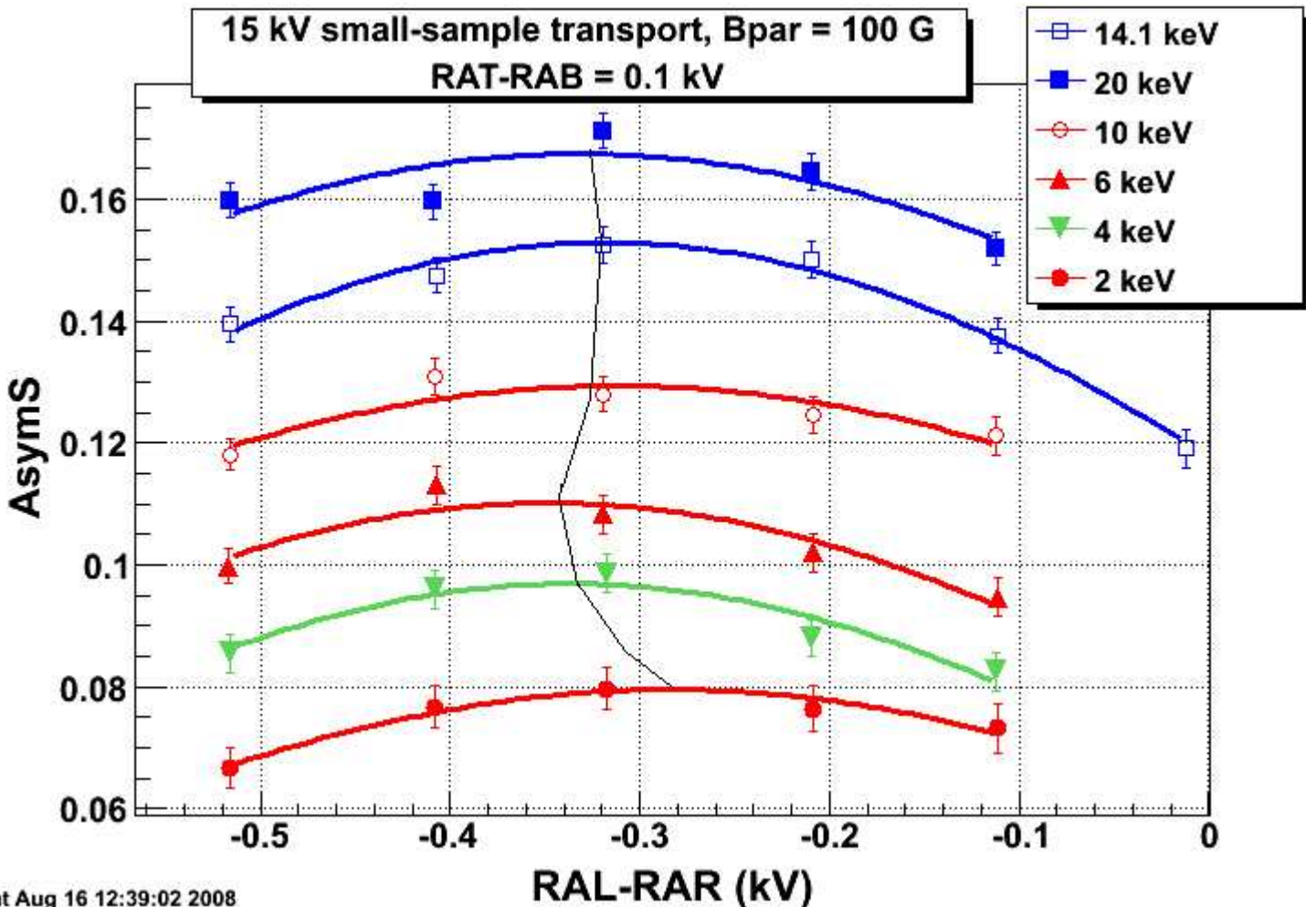



Fri Aug 15 18:30:44 2008



Attachment 6:

[SmallSample_Transport_RAscan_Escan.png](#) 21 kB Uploaded Sat Aug 16 13:39:41 2008
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 [Wed Aug 13 10:18:45 2008, 1524, TP, Info, General, Results of 10x10-mm² Ag-on-Ni](#)

 [Sat Aug 16 10:30:11 2008, 1524, TP, Info, General, Results of 10x10-mm² Ag-on-Ni](#)

Message ID: 4328 Entry time: **Sat Aug 16 10:30:11 2008** In reply to: **4326**

Run:	1524
Author:	TP
Type:	Info
System:	General
Subject:	Results of 10x10-mm ² Ag-on-Ni

RA scans at Bpar = 256 G (8.04 A):

RA-LR scans for varying RA-TB differences, E = 14.1 keV (sample HV=0), gaussian fits, see Figure 1:

RAT - RAB	best RAL - RAR	max. asymmetry
0.0 kV	-1448(17) V	0.096(2)
0.1 kV	-1393(19) V	0.100(2)
0.2 kV	-1432(25) V	0.099(2)
0.3 kV	-1417(19) V	0.099(2)

Fit gaussians to RALR scans to obtain best values to optimum RAL-RAR difference and max. asymmetry, see Figure 2:

Energy	RAL-RAR	Asymmetry	depol. rate
20 keV	-1406(16) V	0.120(2)	0.07(2) 1/us
14.1 keV	-1393(19) V	0.100(2)	0.11(2) 1/us
10 keV	-1447(22) V	0.082(2)	0.08(3) 1/us
6 keV	-1430(30) V	0.067(2)	0.18(3) 1/us
4 keV	-1489(52) V	0.054(2)	0.14(4) 1/us
2 keV	-1310(150) V	0.057(4)	0.45(11) 1/us
2 keV	-1813 V	0.038(4)	0.28(7) 1/us

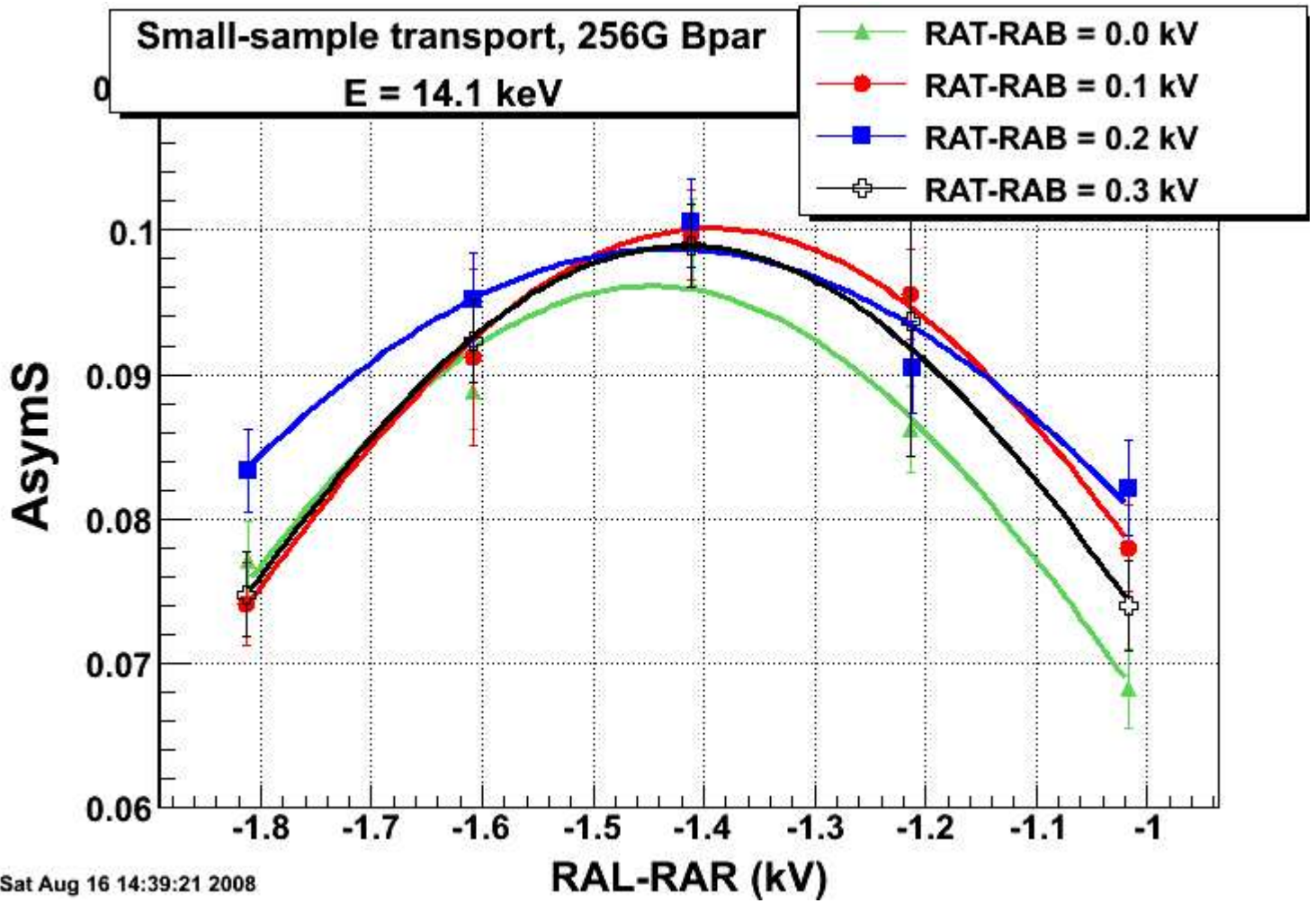
The 2-keV data are not straightforward to interpret: probably, the best criterion is to look for the minimum in depolarization rate and approximate equality of N_L and N_R counts instead of looking for the maximum in asymmetry.

RA scans at Bpar = 150 G (4.73 A):

Fit gaussians to RALR scans to obtain best values to optimum RAL-RAR difference and max. asymmetry, see Figure 3:

Energy	RAL-RAR	Asymmetry	depol. rate
20 keV	-588(10) V	0.161(2)	0.08(2) 1/us
14.1 keV	-646(09) V	0.141(2)	0.09(2) 1/us
10 keV	-606(11) V	0.121(2)	0.12(2) 1/us
6 keV	-634(13) V	0.102(2)	0.14(2) 1/us
4 keV	-631(15) V	0.084(2)	0.08(2) 1/us
2 keV	-544(53) V	0.070(3)	0.21(3) 1/us

Attachment 1: [SmallSample_Transport_RAscan_256G_14.1keV.png](#) 22 kB Uploaded Sat Aug 16 15:39:53 2008 | [Hide](#) | [Hide all](#)



Attachment 2:

[SmallSample_Transport_RAscan_Escan_256G.png](#) 24 kB Uploaded Sun Aug 17 12:23:21 2008 | [Hide](#) | [Hide all](#)

