Message ID: **4474** Entry time: **Fri Dec 19 17:07:27 2008**

Run:	3297
Author:	TP
Type:	Info
System:	General
Subject:	Change to 30x30 mm2 Ag foil

Fri Dec 19 17:12:55 2008
Changed to Konti-2, 30x30mm^2 Ag foil (Goodfellow, 99.999...%),
Ag-coated Al sample plate.

Purpose: measure A(E) at 100G and 1100G, eventually A(B).

Check 4 red LEDs on Konti-2 after 5 days at 20K:
- 1 LED dead
- 1 LED "one eye of seven" still working
- 1 LED "two eyes" working
- 1 LED "four eyes" working

Results of the Ag measurements

Result of the A(E) at 100G and 1140G, 14kV transport, is shown in Figure 1. The reduction of A at 1140G is due to the finite time resolution of the LEM setup.
At low energies the 100G asymmetry decreases faster with decreasing energy. The question is if this could be caused by the *reflected* muons which are removed from the sample region in high magnetic fields and RA-off. The 1140G A(E) data are closer to Trim.SP which predicts less *backscattered* muons than suggested by the 100G data.

Figure 2: Comparison of A(E) at 100G and 1140G with TrimSp prediction:
at 1140G A(E) agrees well with TrimSp down to 3keV, whereas at 100G there are already deviations below 5keV:

Figure 3: damping rate as a function of energy at 100G and 1140G:
(nearly) no energy dependence of lambda at 1140G; at 100G we have the well known increase below ~5keV.

Figure 2 and 3 suggest **that the reflected muons** (which are removed from the sample area in 1140G, whereas they probably stop in the radiation shield at 100G) **are not only the origin of the change of depolarization rate but that they account partly also for the deviations between TrimSp and measured data.**
See also elog:LEM_Experiment/4109 for a comparison of RIKEN-RAL/PSI LEM data on Au.

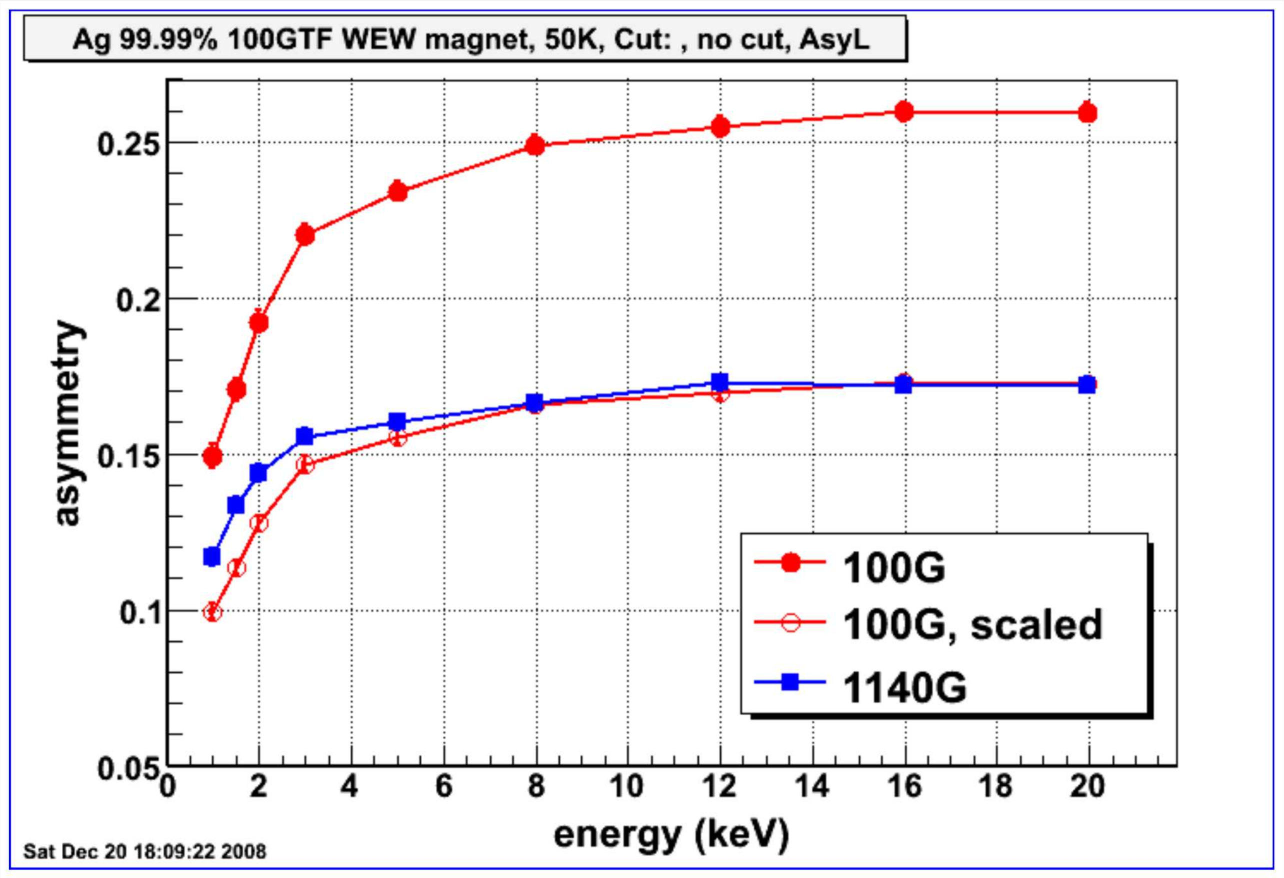
Figure 4: Asymmetry as a function of B field. A(B) decreases exponentially, indicating a "Lorentzian" instead of Gaussian for the time resolution; this is reasonable because of the long tail at larger times in the time-of-flight spectra.

A(B) = A(0)*exp(-lambda*omega) = A(0)*exp(-lambda*2pi*freq) == A(0)*exp(-slope*freq), slope = lambda*2pi

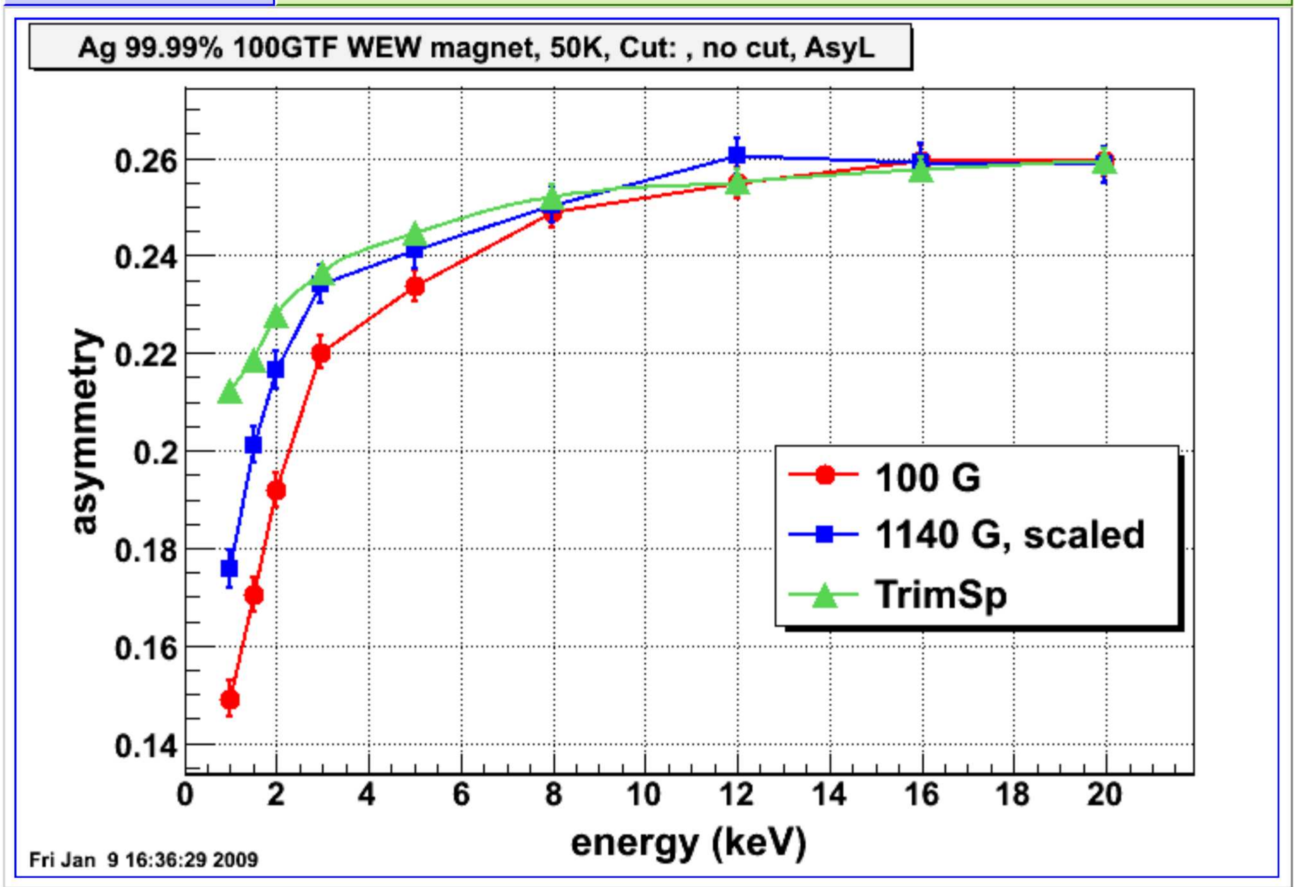
lambda = HWHM of time-of-flight distribution.
lambda = slope/2pi = 0.0316/MHz/2pi = 5 ns.
Experiment: (Run lem08_his_1391.root, 15kV, L3=9.75kV, RA=0): "lambda" ~ 5.5 ns.

The old MCP2 A(B) measurements had the problem that the fraction of muons missing MCP2 changed as a function of B due to the B-dependent beam spot size. Now, even for largest beam spots we stop all muons on the Ag foil or on the Ag layer of the sample plate with 7 cm diameter.

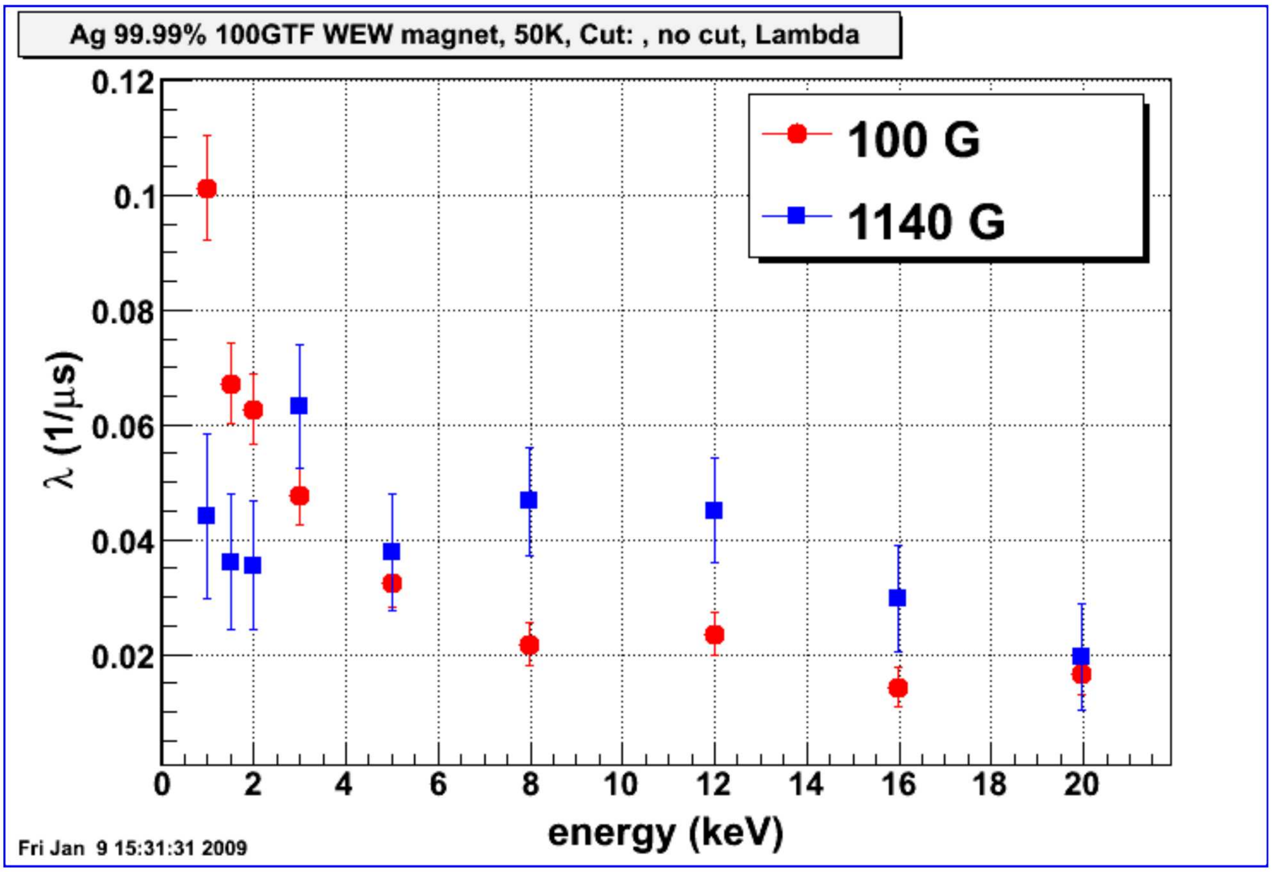
Attachment 1:	Ag_Escan_100-1140G.png 18 kB Uploaded Sat Dec 20 18:10:23 2008 | Hide | Hide all



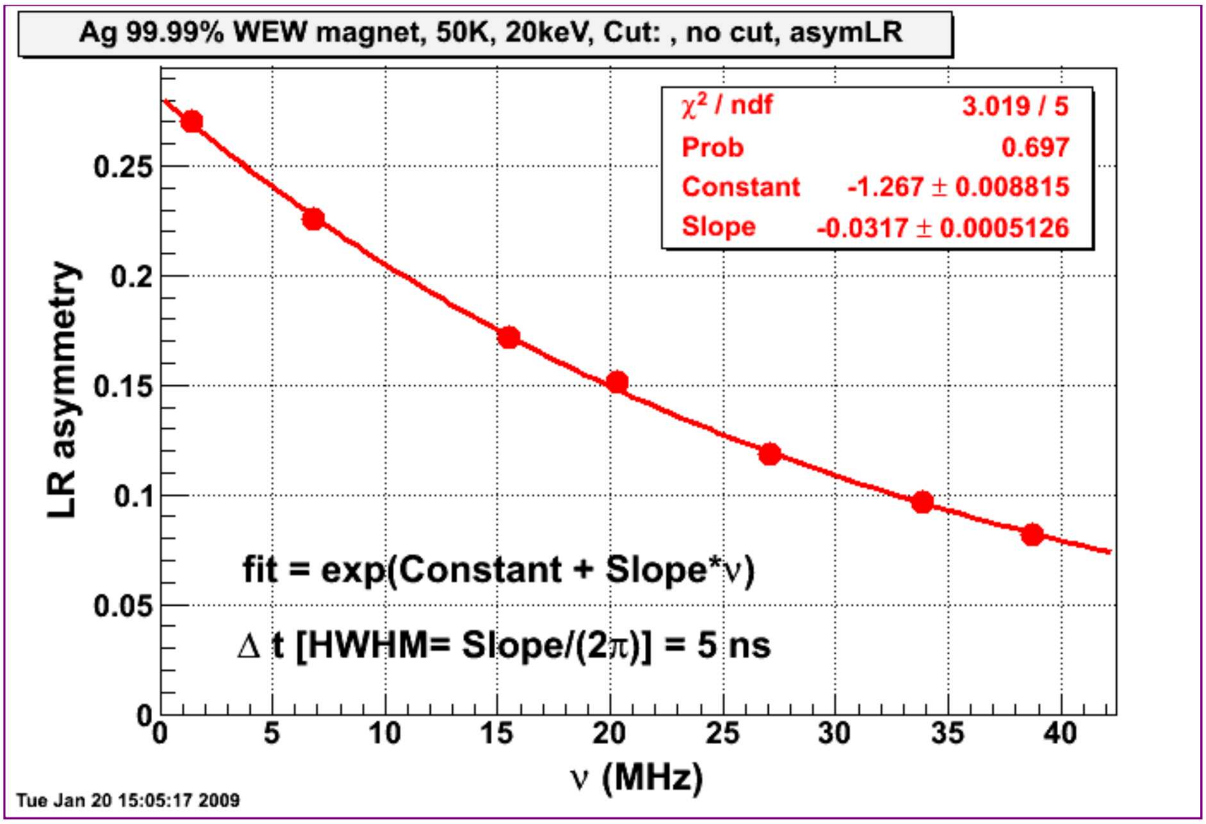
Attachment 2:	Ag_Escan_100-1140G-TrimSp.png 20 kB Uploaded Tue Jan 13 10:34:48 2009 | Hide | Hide all



Attachment 3:	Ag_Escan_100-1140G_Rate.png 16 kB Uploaded Tue Jan 13 10:35:09 2009 | Hide | Hide all



Attachment 4:	Ag_Bscan_20keV.png 21 kB Uploaded Tue Jan 20 15:09:11 2009 | Hide | Hide all



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Attachment 5:	Gauss-versus-Lorentzian.png 23 kB Uploaded Tue Jan 20 17:06:25 2009 | Hide | Hide all