Hall A Møller Polarimeter after Upgrade

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What was done?

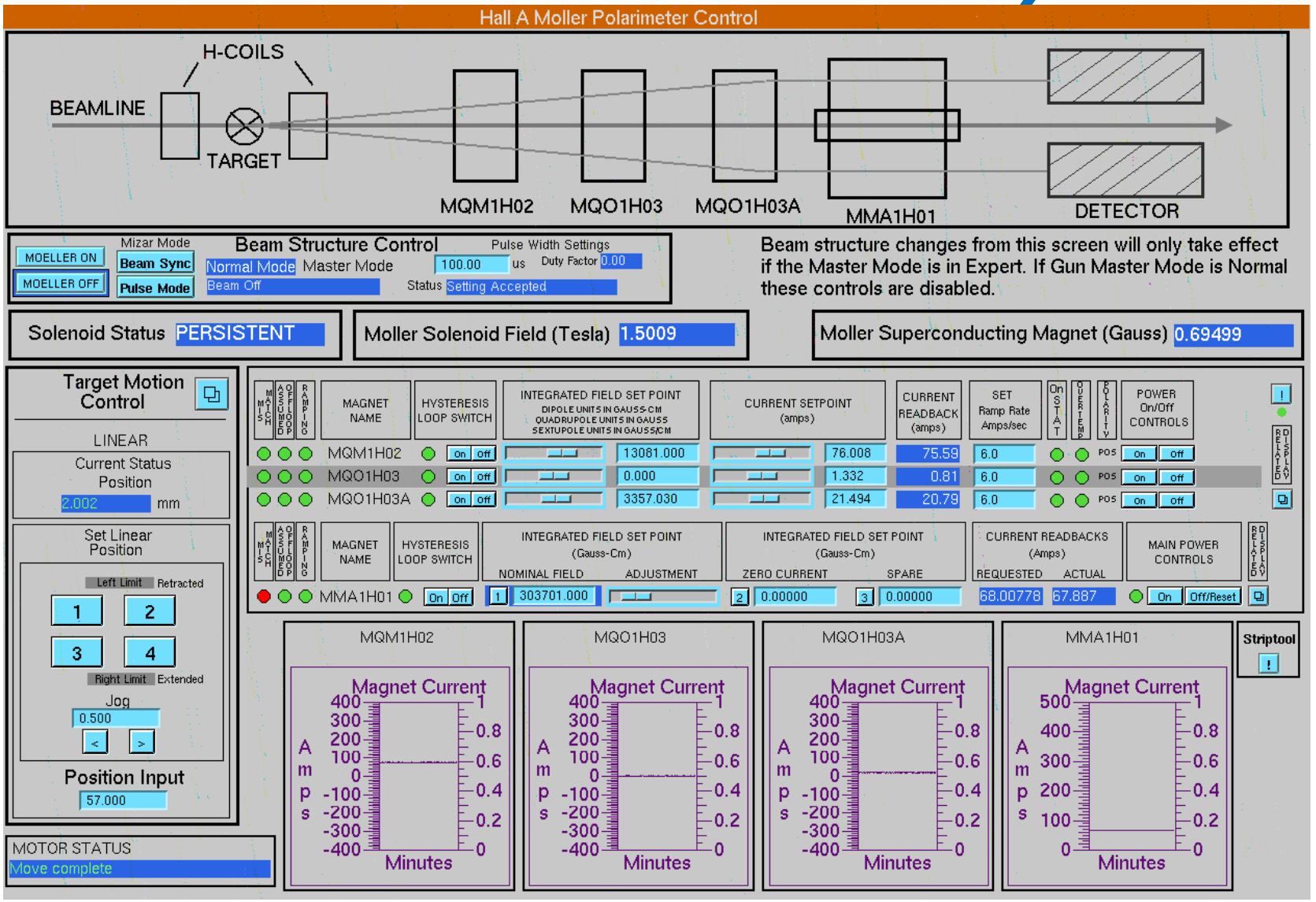
1. Polarized electron target "brute force" 3T (smaller thickness, lower heating)

2. Segmented aperture detector (higher rate)

3. Introduce a beam duty cycle (reduce heating, increase beam current)

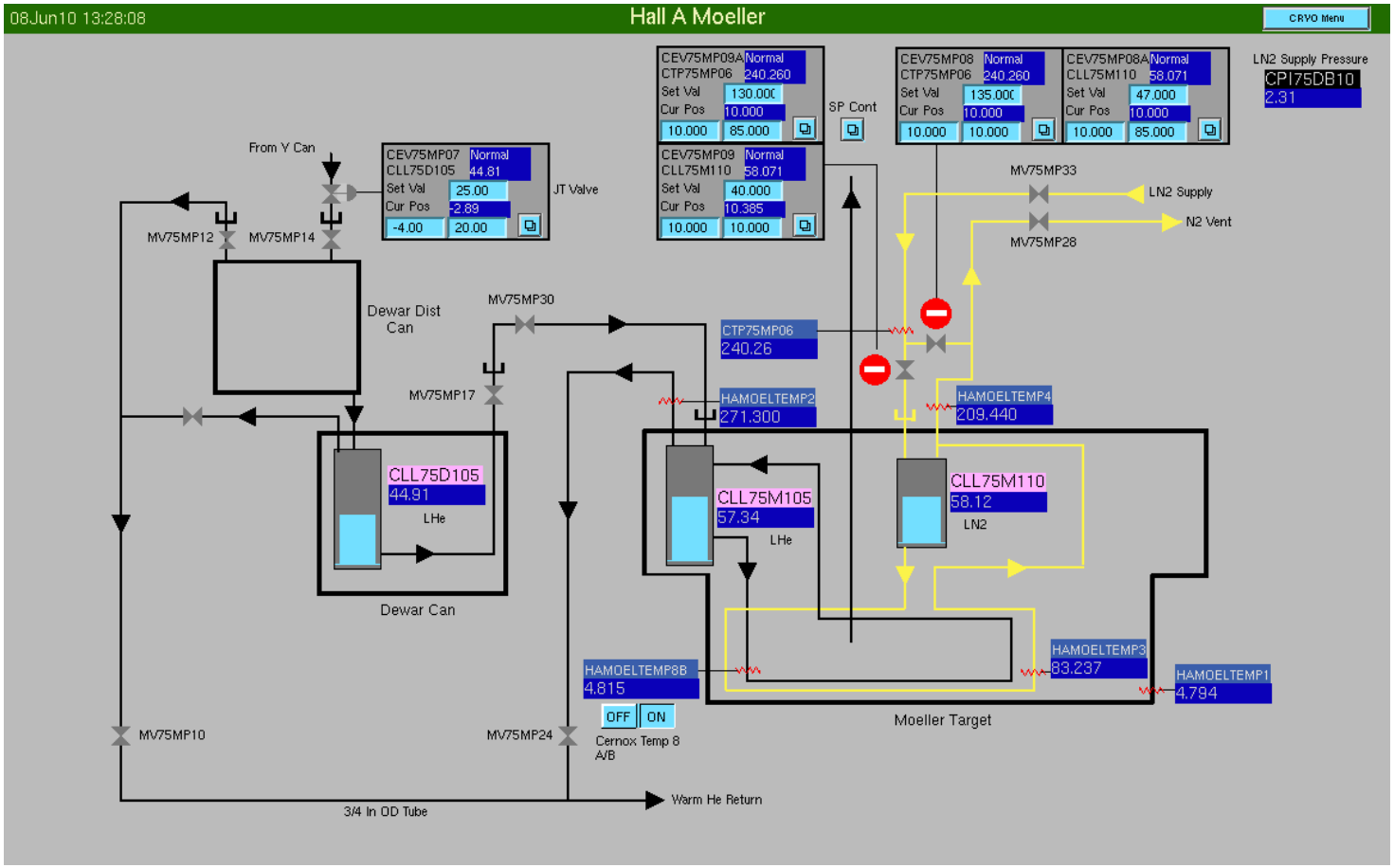
4. New fast DAQ based on FADC (higher rate, smaller dead time, more information etc.)

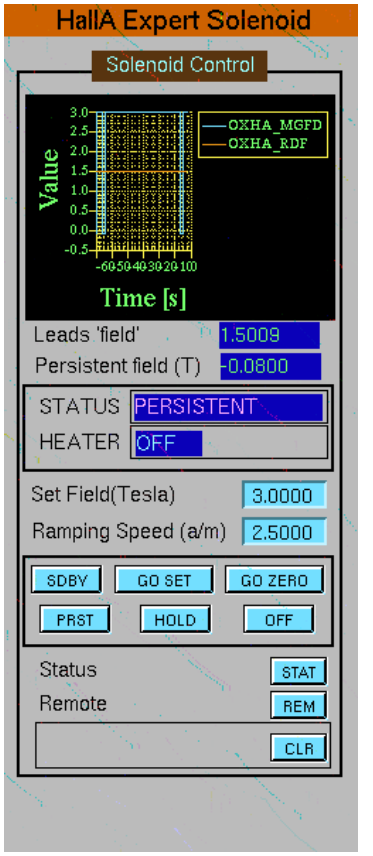
Møller Polarimeter Layout



"EXPERT" mode – polarization measurement with the beam current up to 10μA

Møller Superconducting Magnet



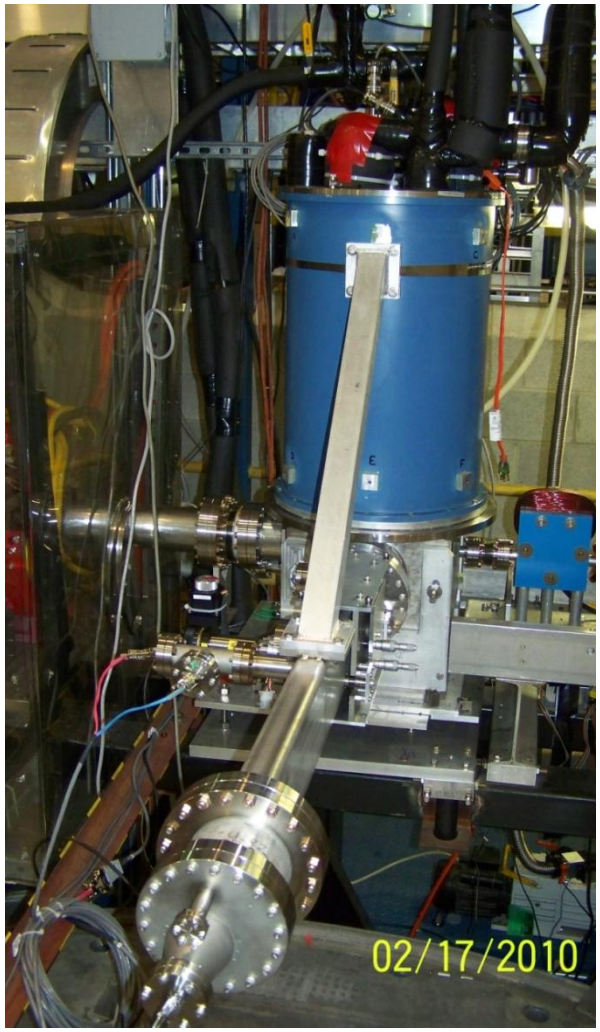


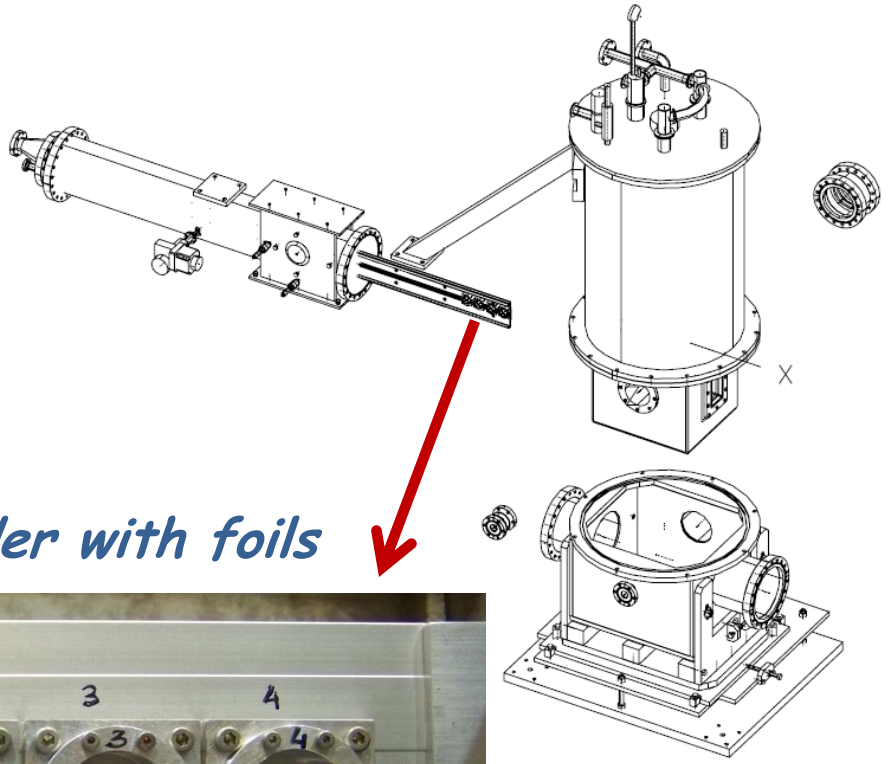
Working very stable

Alignment test:

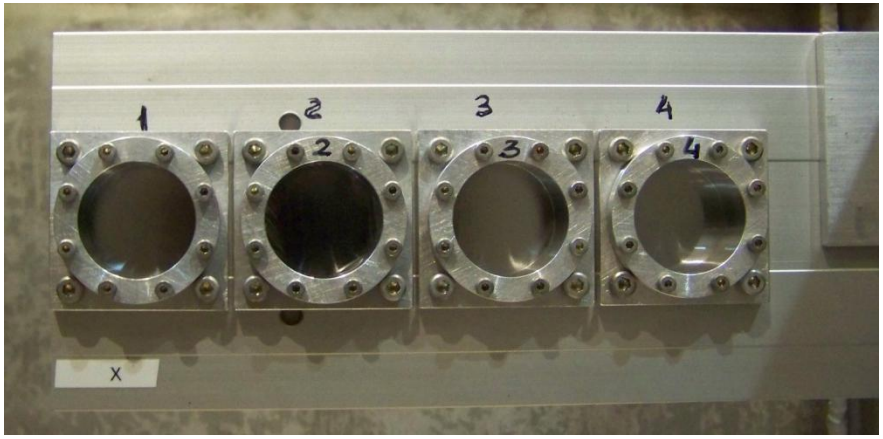
X=-0.2mm Y=-1.7mm Horiz=-1.6mrad Vert=+6.1mrad

New Møller Target



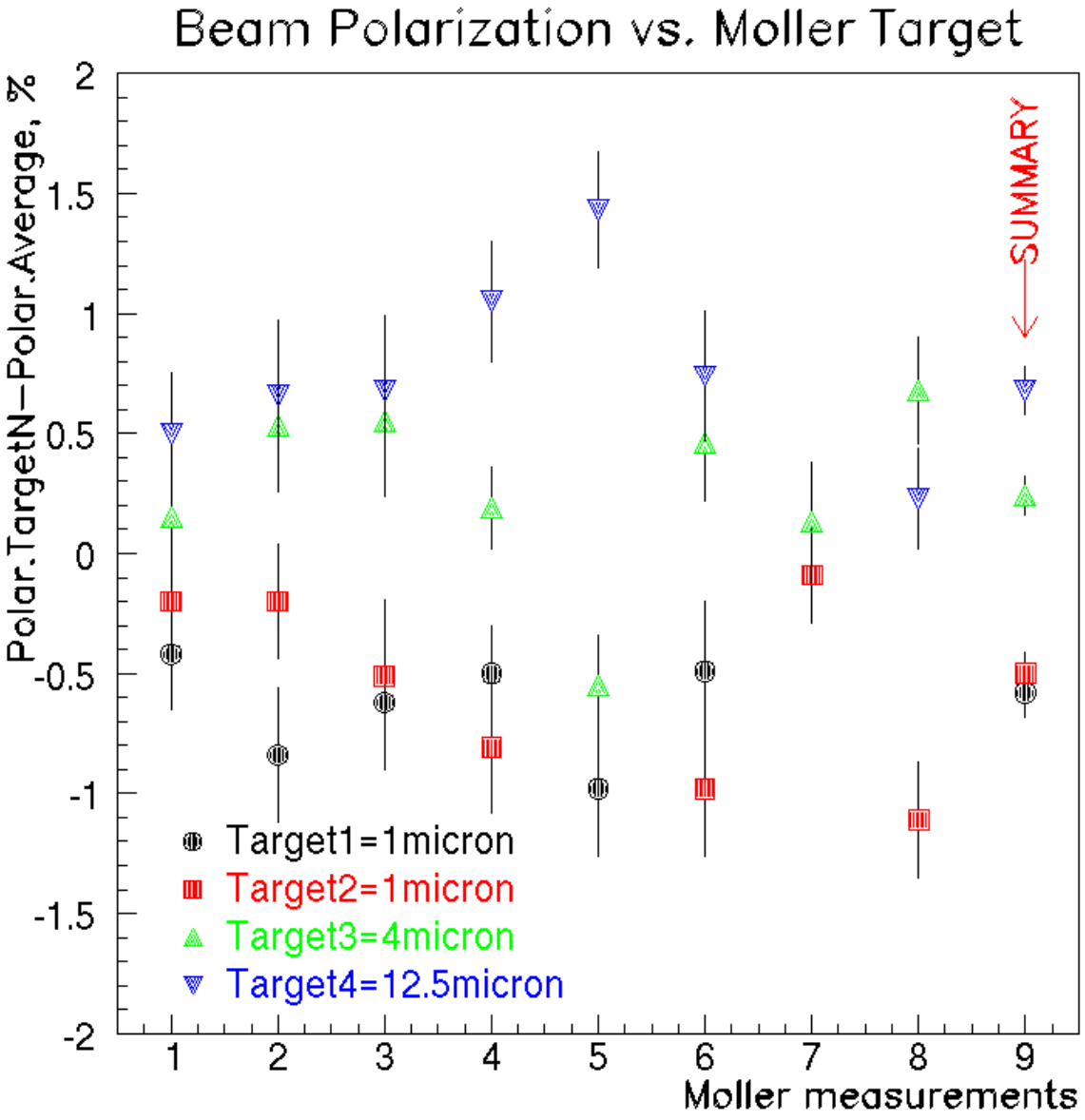


Target holder with foils

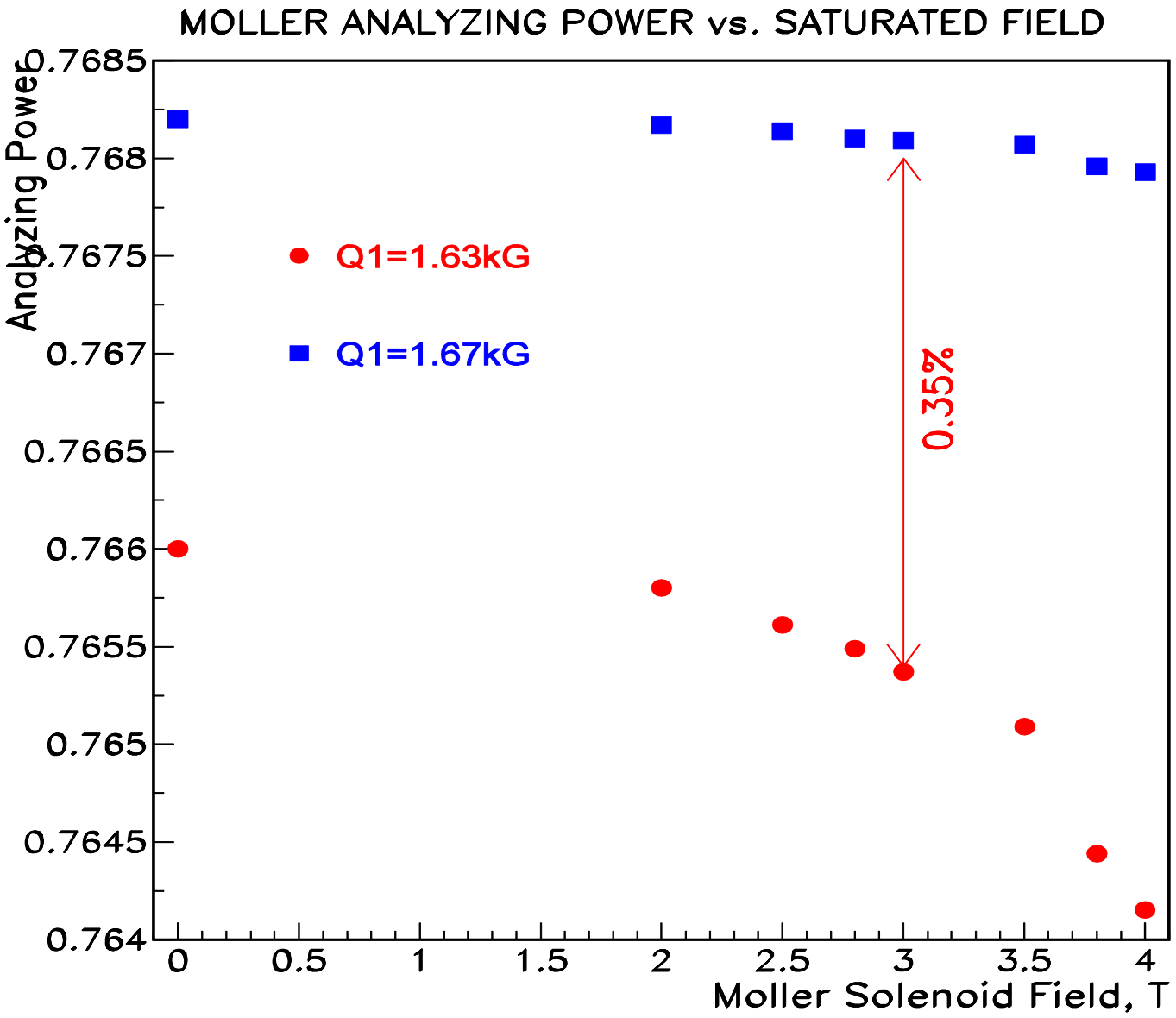


Targets: Fe(99.85%) foils 1-1μm, 2-1μm, 3-4μm, 4-12.5μm

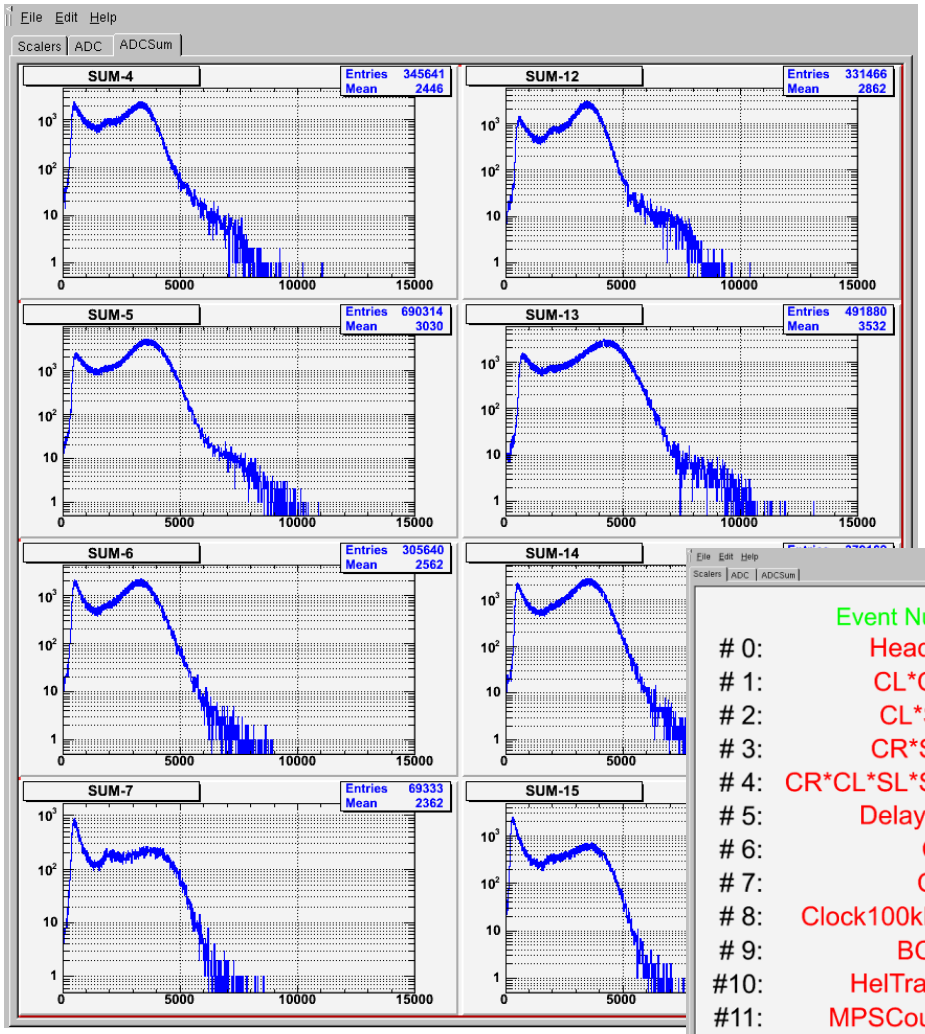
Møller Target Systematic Error

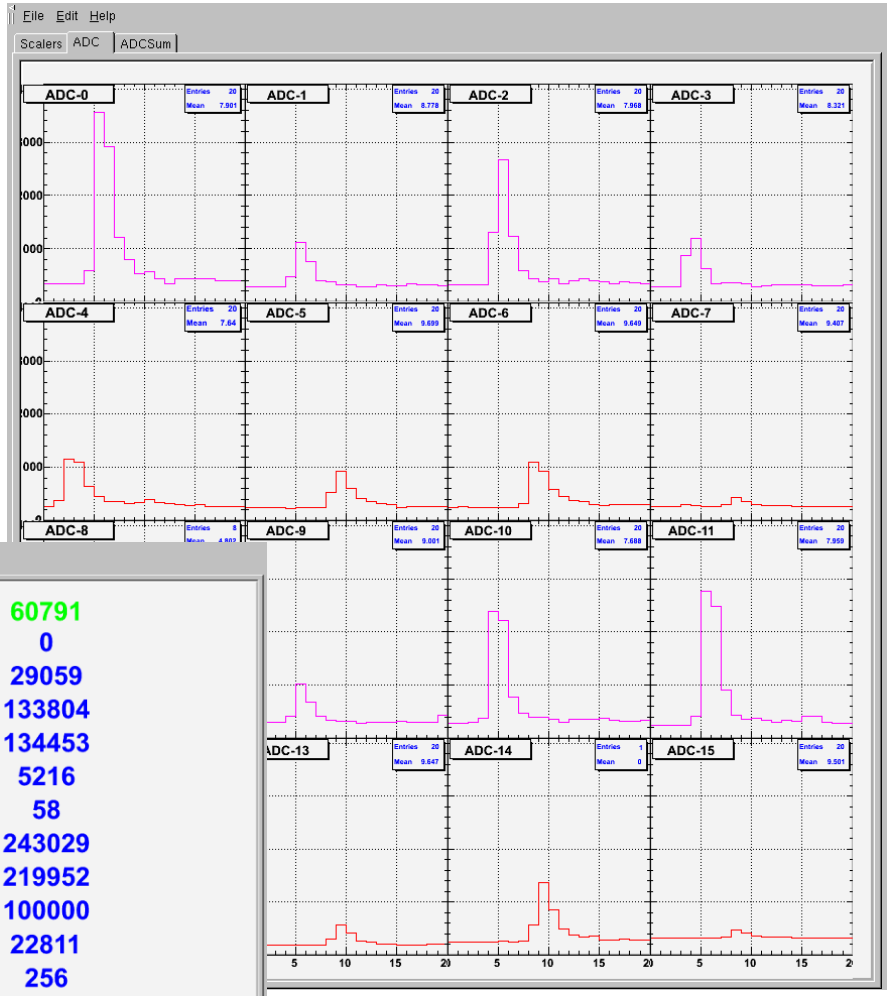


Møller Polarimeter Analyzing Power



On-line FADC monitor





"TO DO" LIST

Magnet:

New alignment

Fix small software bags

Remotely controlled LHe magnet filling

COLD RETURN LINE

Target:

Replace foils Fe 99.85%->99.99%

12.5μm -> 10μm

Analyzing power:

Test Q1 (the first Møller quad)

Old DAQ:

Upgrade discriminator and PLU

FADC:

Improve analyzer

Improve analysis

SYSTEMATIC ERROR ≤1%