Compton Polarimetry Status

- *Compton Polarimeter Overview.*
- *Recent Results.*
- *Integrating Photon Signal Method.*

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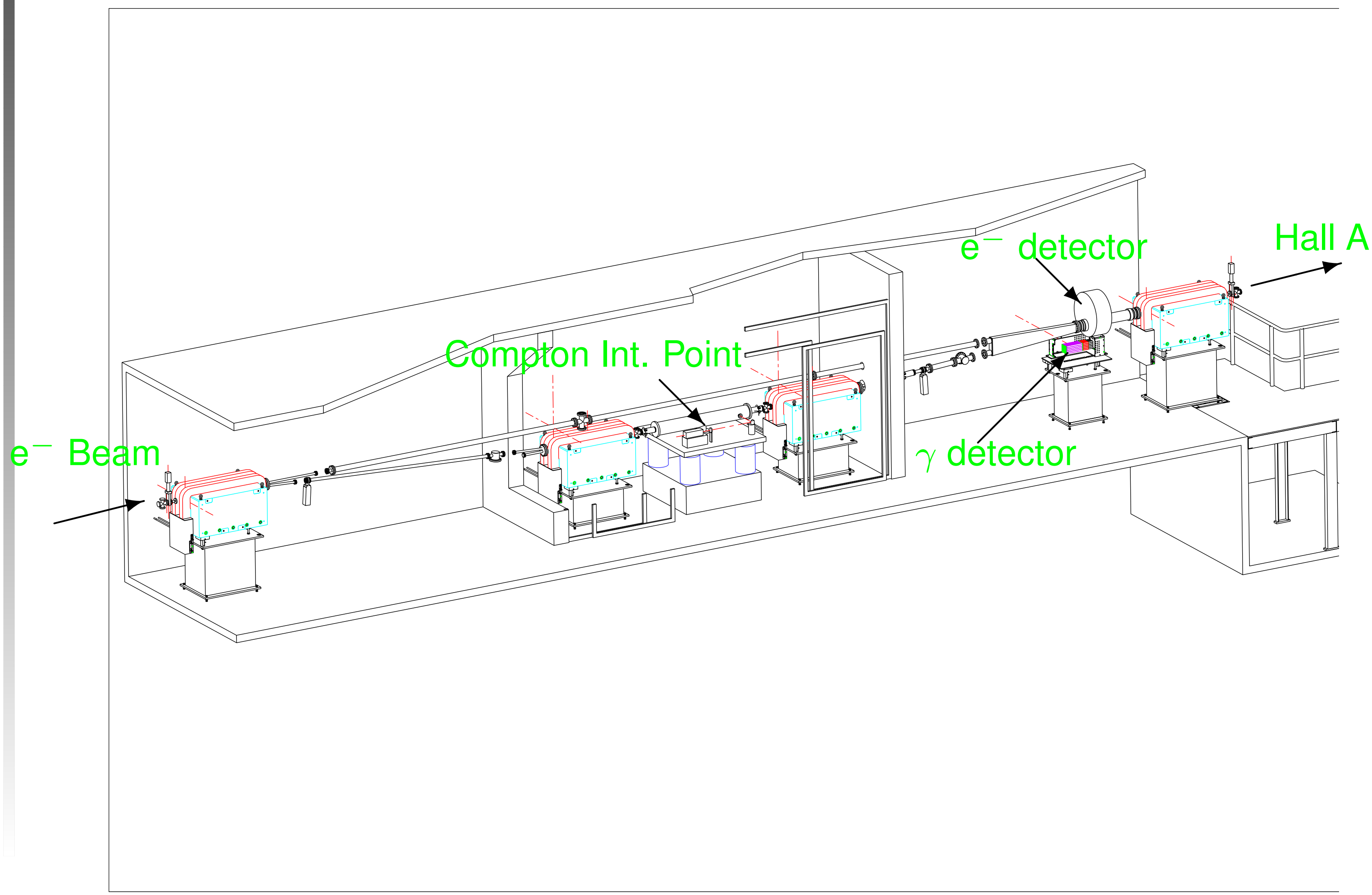
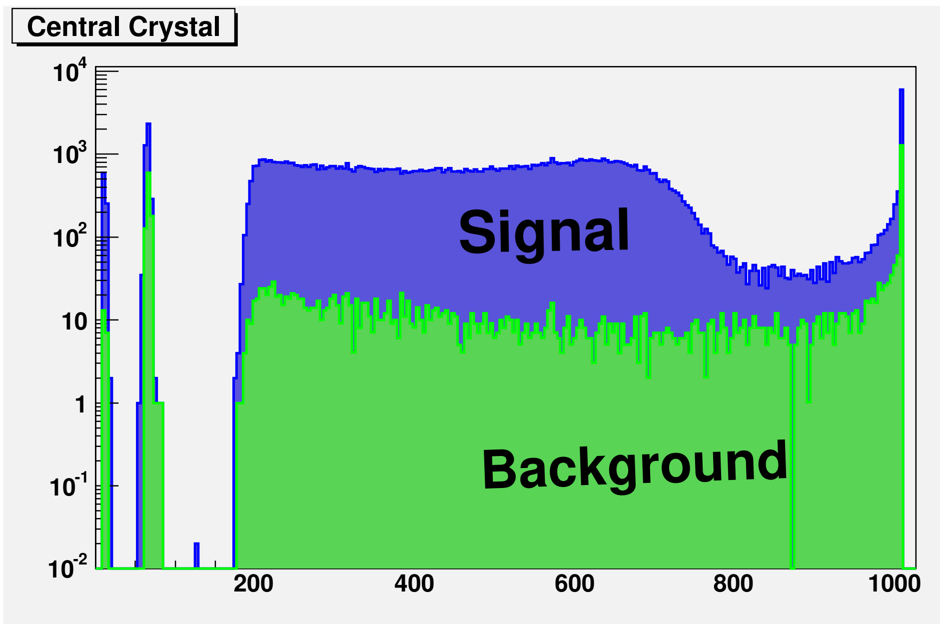
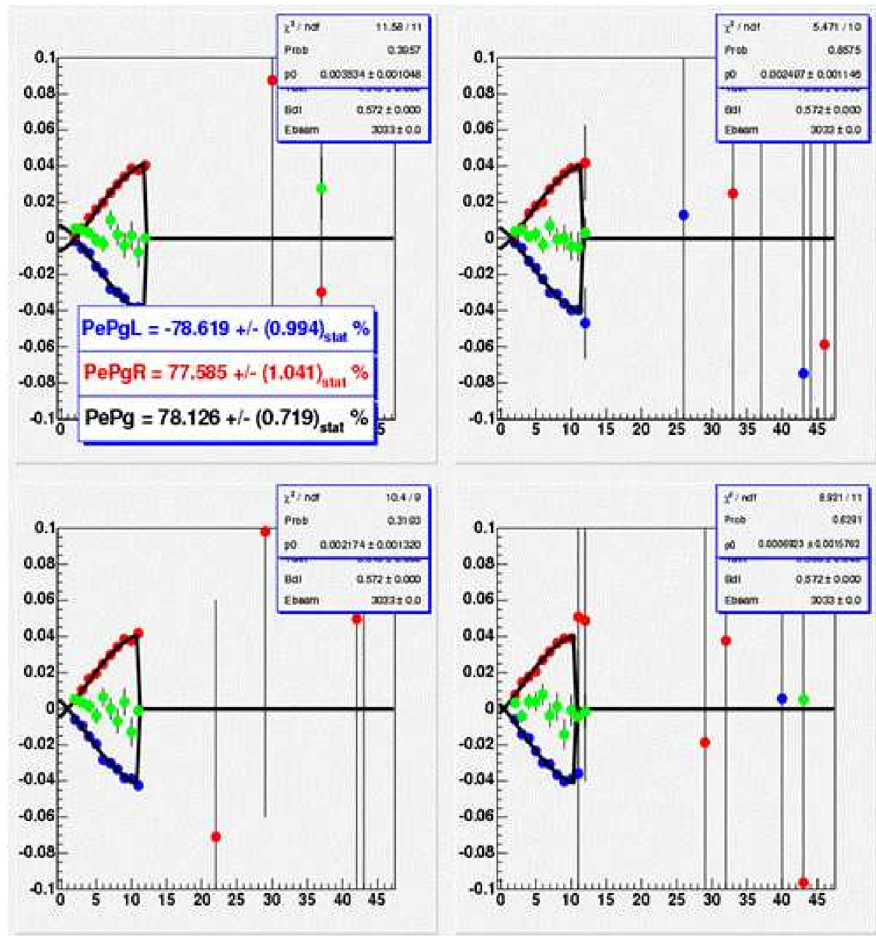
Compton Polarimetry



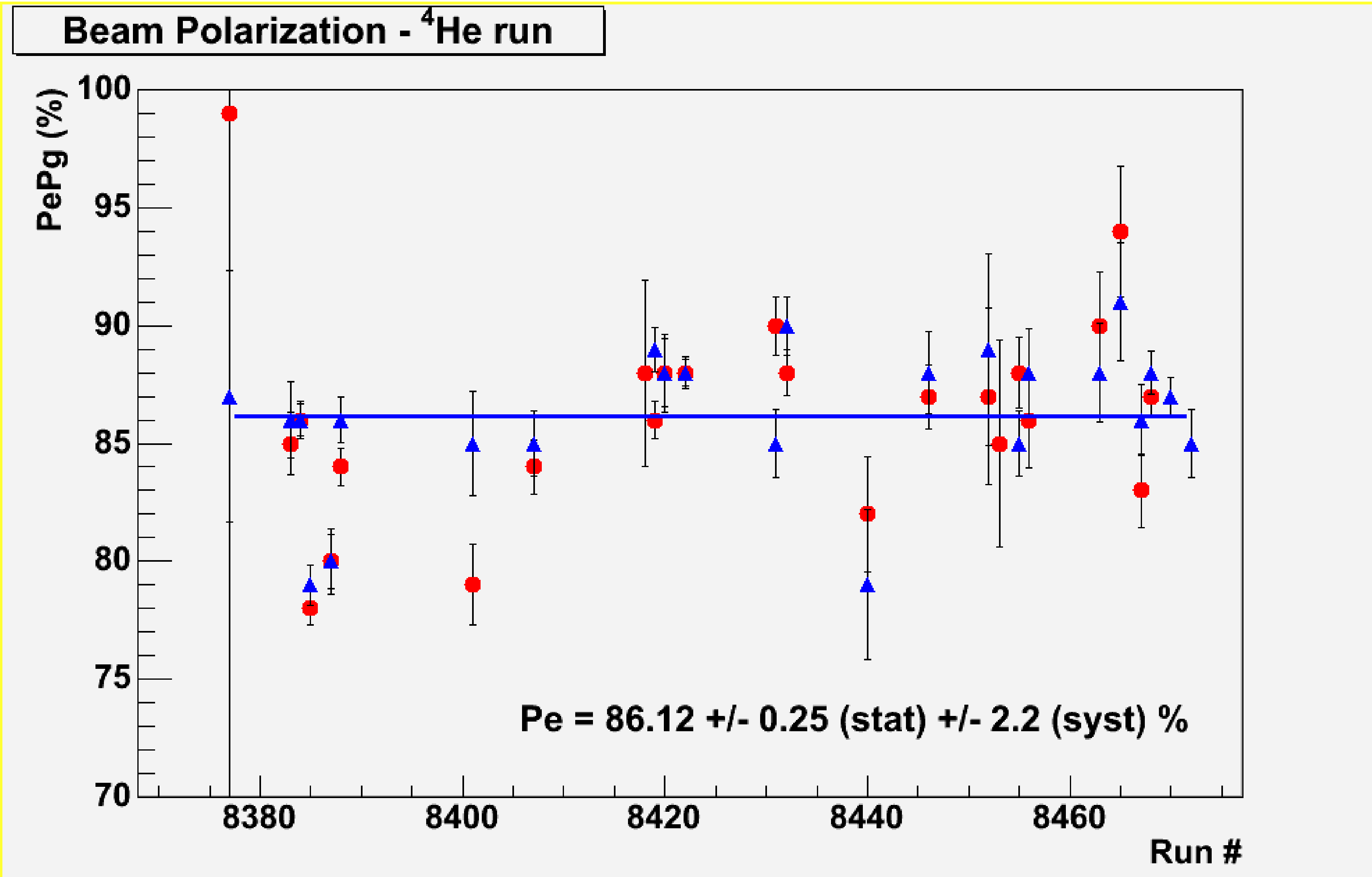
Photon & Electron Spectra



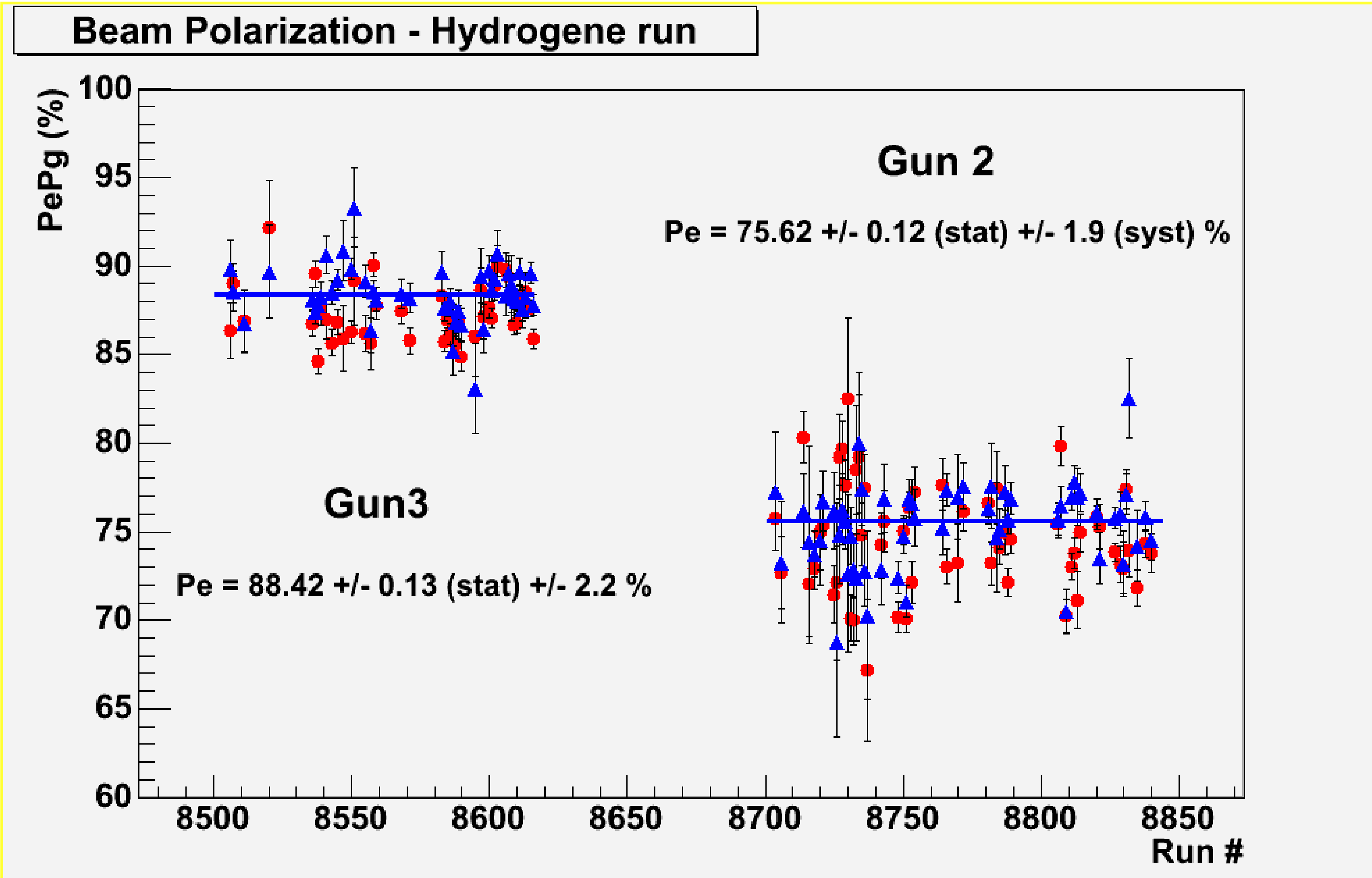


Recent Results : Happex Helium 4

- Using Gun3 with strained superlattice photocathode .



Recent Results : Happex Hydrogen

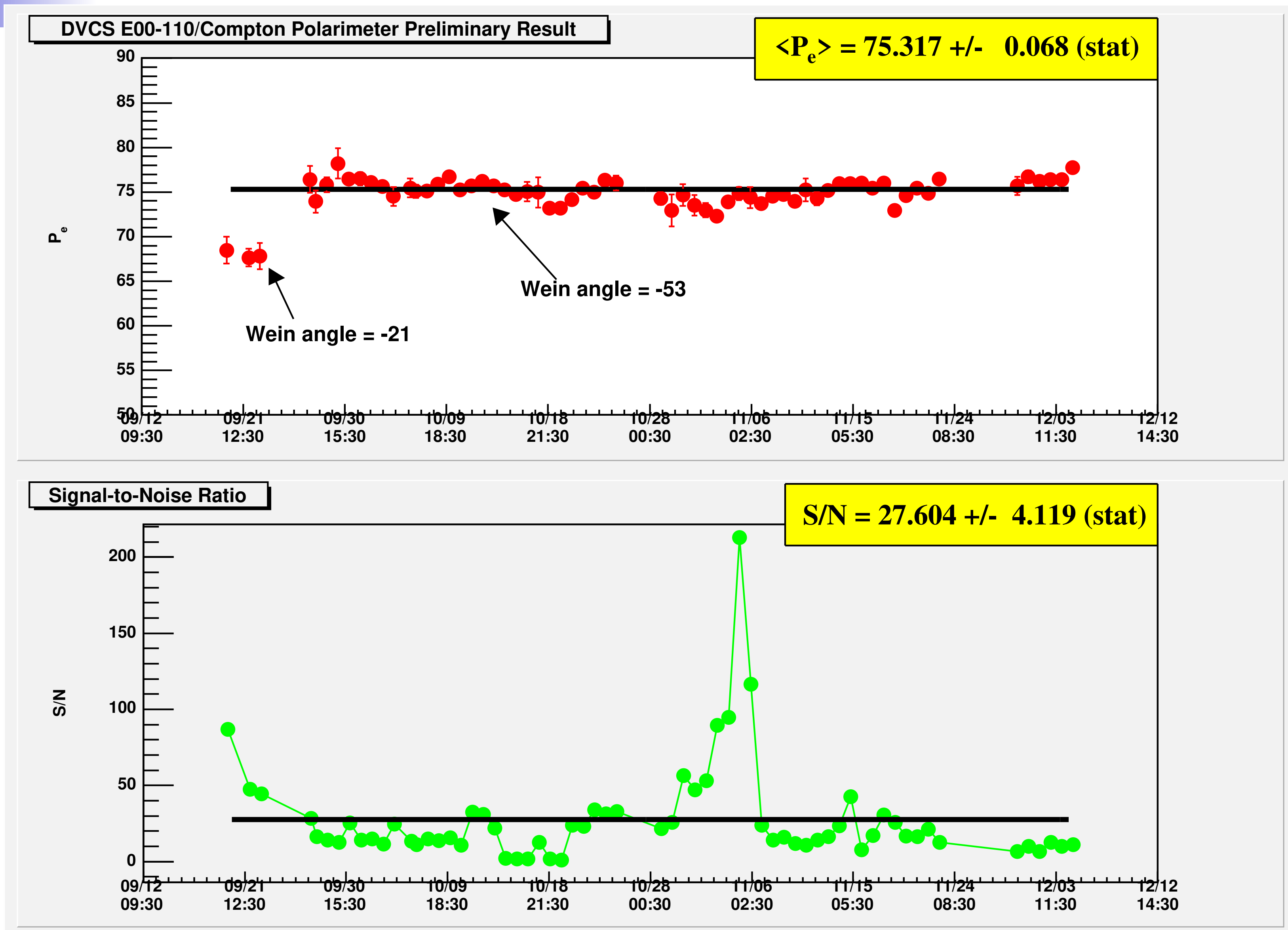


Compton Photon Analysis

Error Budget :

	Happex run	Next Year	Integrating Method
P_γ	1.50%	1.00%	1.00%
Response function	1.25%	1.25%	No
Dead time	1.00%	0.50%	No
Pile up	1.00%	0.50%	No if linear
Radiative Corr.	0.25%	0.25%	0.25%
Bgr. Subtraction			0.50%
Total	2.50%	1.80%	$\sim$ 1.00%

Recent Results : DVCS

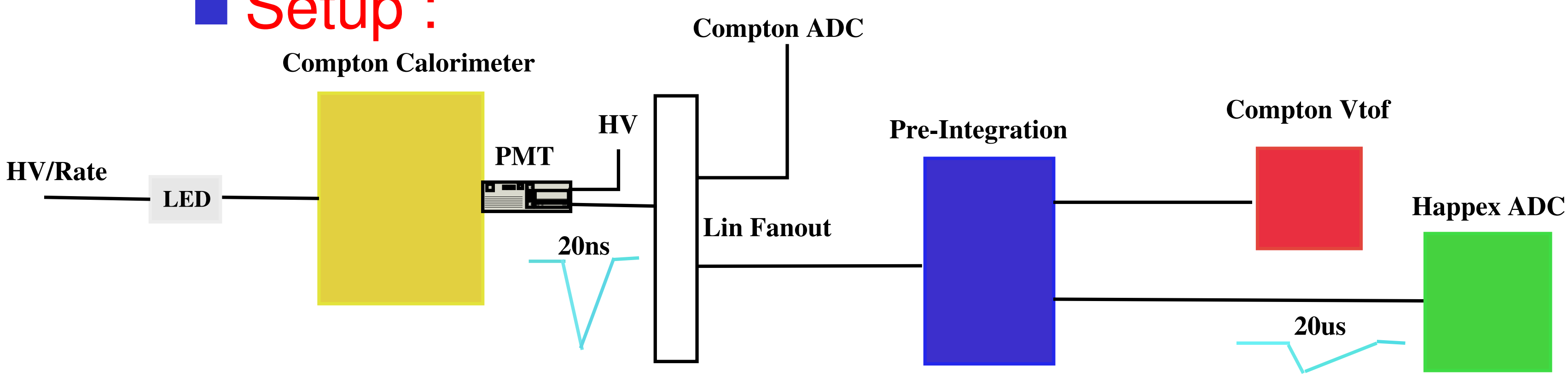


Integrating Compton Photon Signal

1. **Differential (or Counting) Method :** scattered photon or electron energy measured each event which introduced systematics errors related to the details of the detectors and electronics response function .

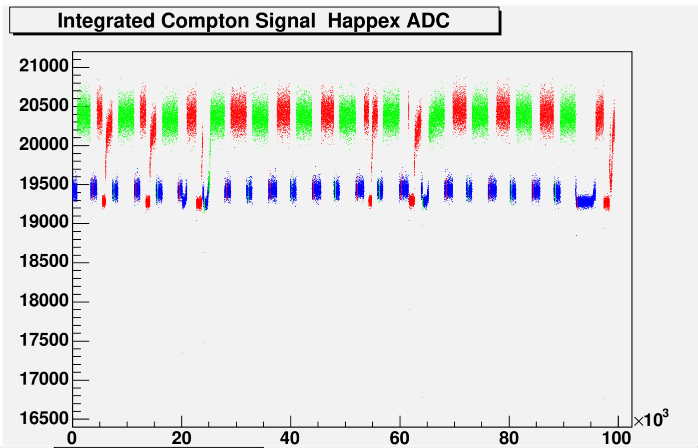
2. **Integrating Method :** integrate over energy range the total compton signal for each helicity state.

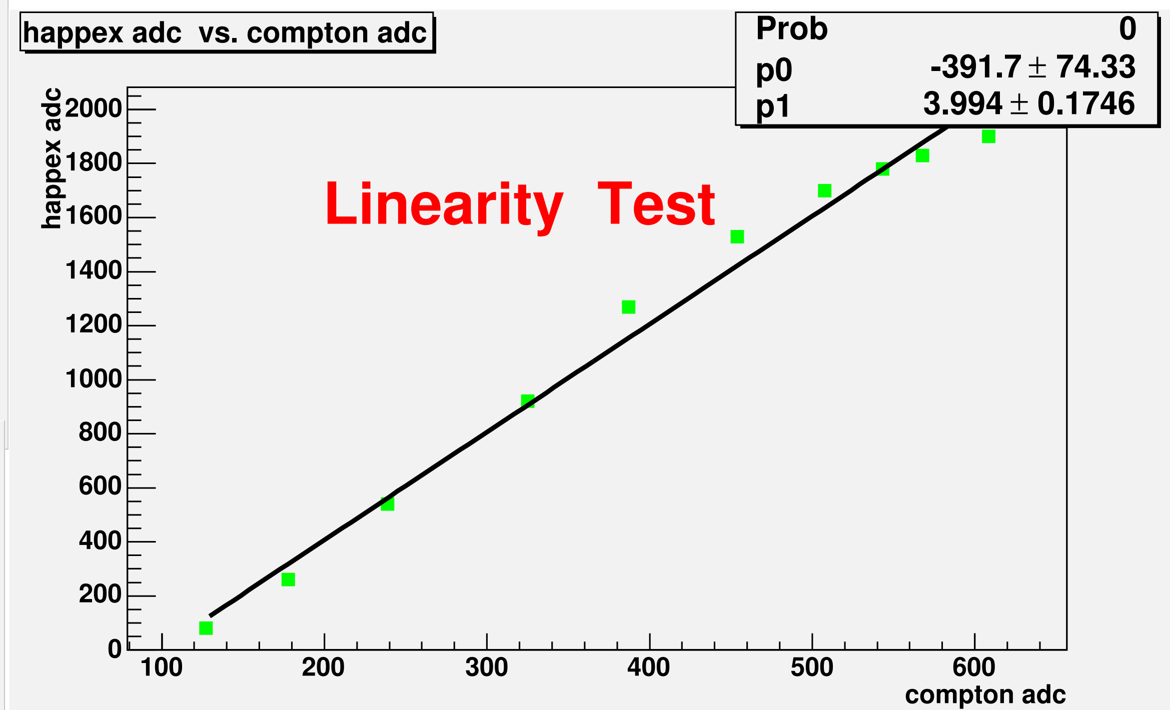
   - **Motivation :** reduces the above systematics to roughly 1 % by getting rid of response function and dead time systematics .
   - **Setup :**

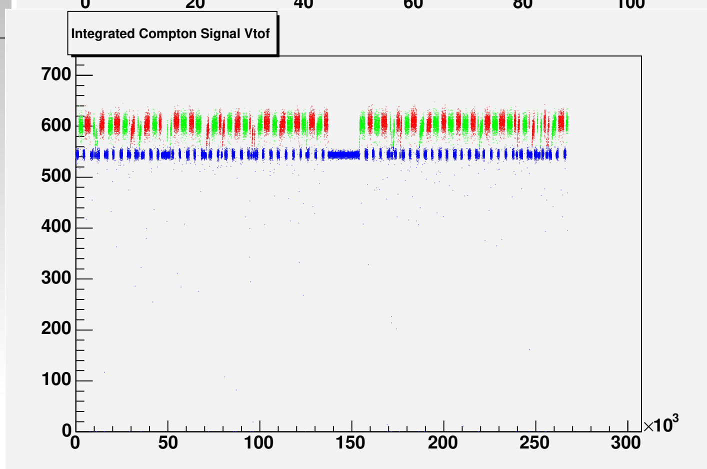


Int. Signal Happex vs. Compton DAQ

- Integrated Compton signal, Compton Cavity Lock (ON, OFF) and Compton Laser Polarisation cables are connected to Happex DAQ .
- Linearity : done some tests and still working on that .

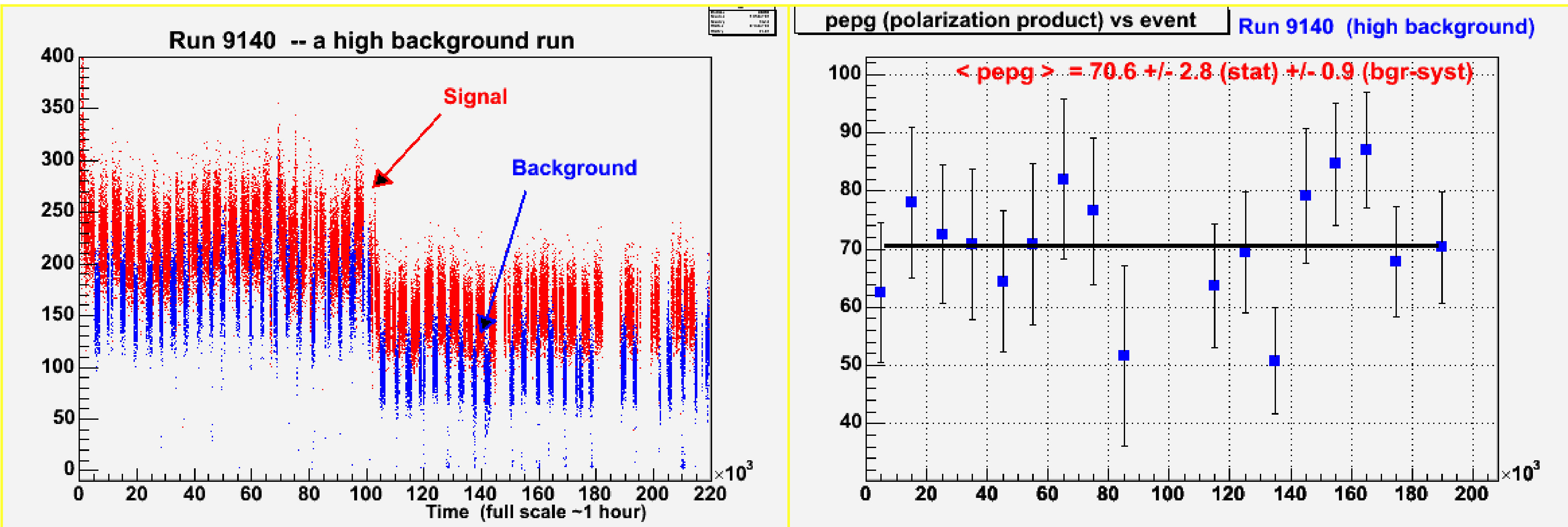






High Background Example

- Bad run where no clear separation between Signal and Bgr.
- S/ N = 0.8



Comparing integrating to counting Method