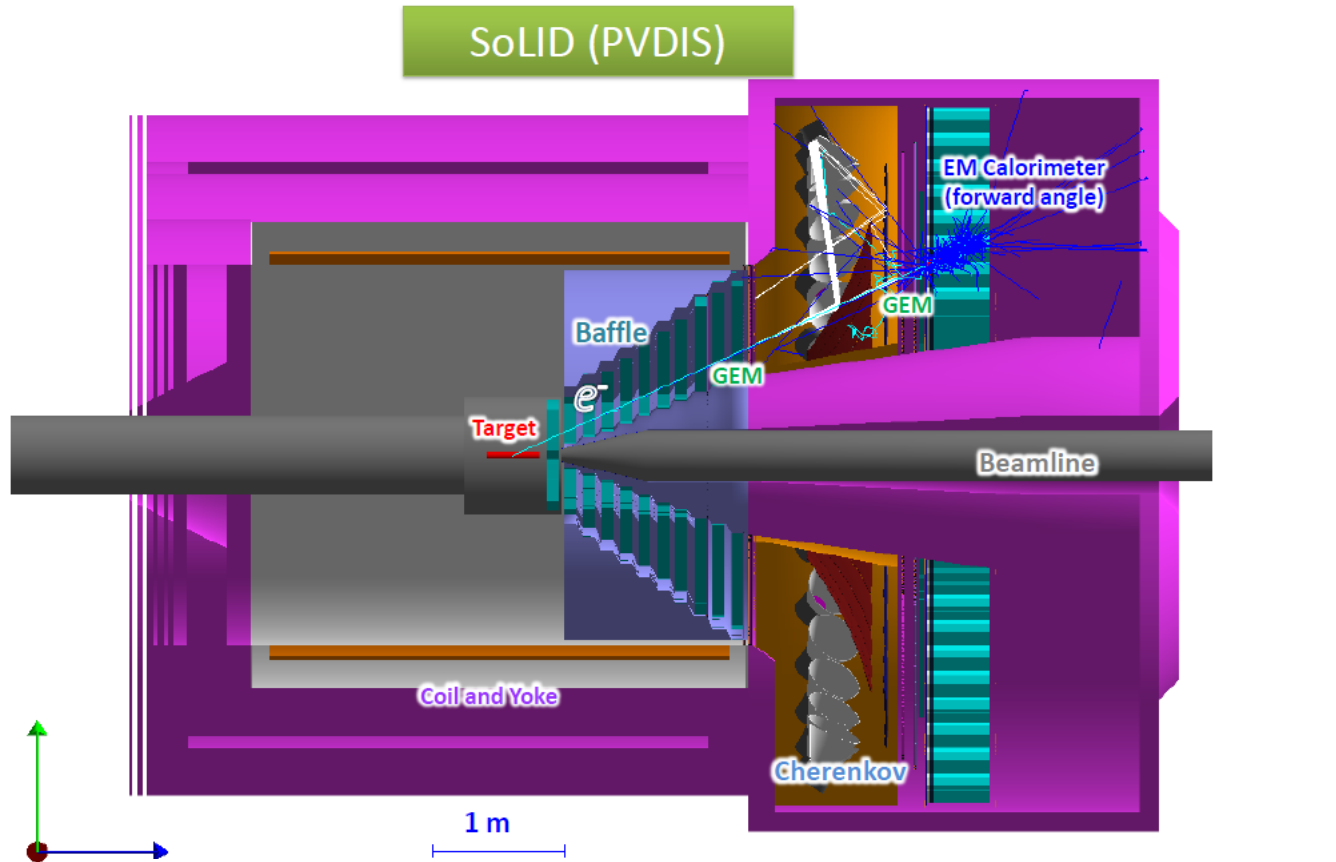# SoLID PVDIS deadtime measurement

Alexandre Camsonne

SoLID PVDIS


| PVDIS Systematic (rel.)		SIDIS Systematic (abs.)		SIDIS Systematic (rel.)	
Polarimetry	0.4%	Raw asymmetry	0.0014	Target polarization	3%
Q^2	0.2%	Detector resolution	< 0.0001	Nuclear effect	$(4-5)\%$
Radiative corrections	0.2%			Random coincidence	0.2%
Reconstruction errors	0.2%			Radiative correction	$(2-3)\%$
				Diffractive meson	3%
Total	0.6%	Total	0.0014	Total	$(6-7)\%$

PVDIS Asymmetry Uncertainty (%)
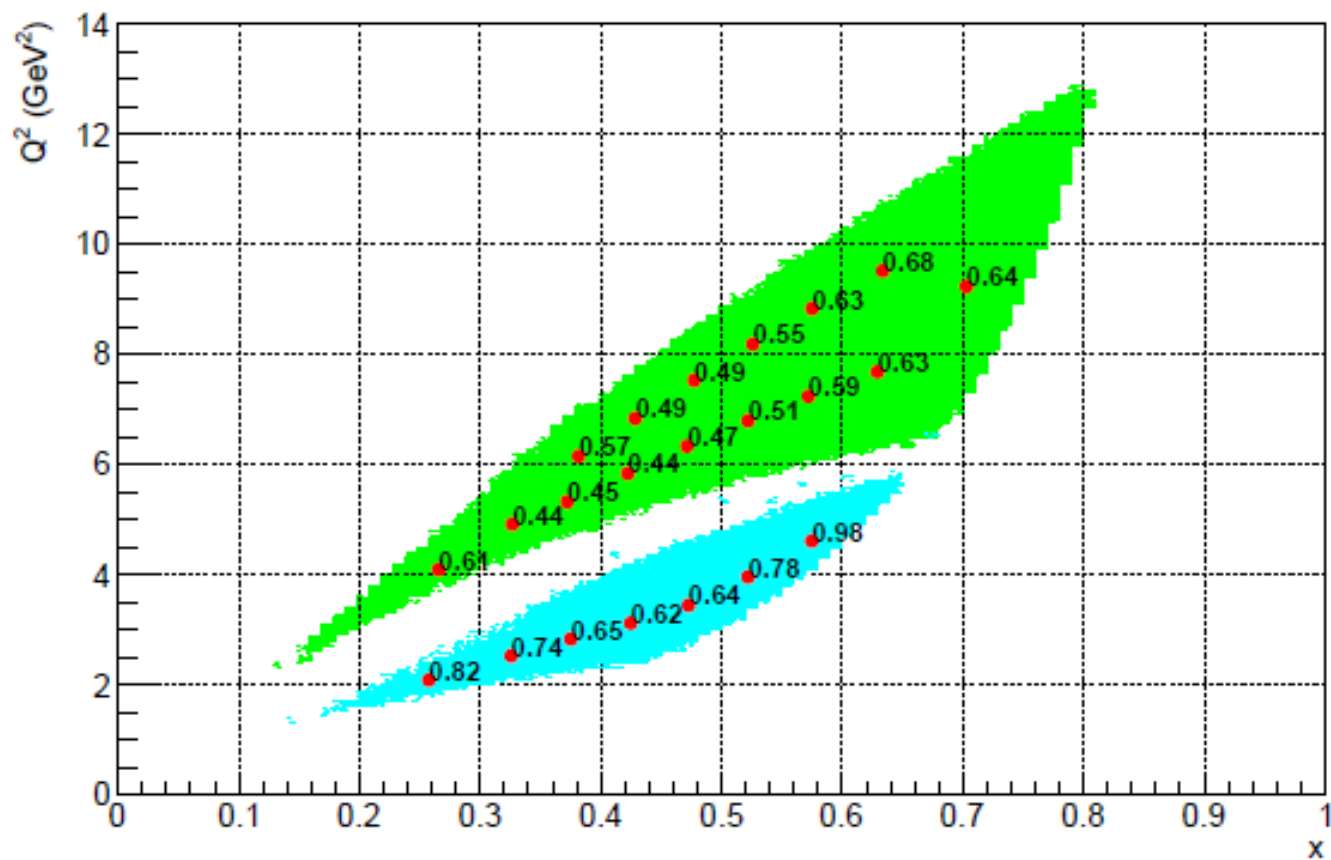
Asymmetry of order of 100 ppm

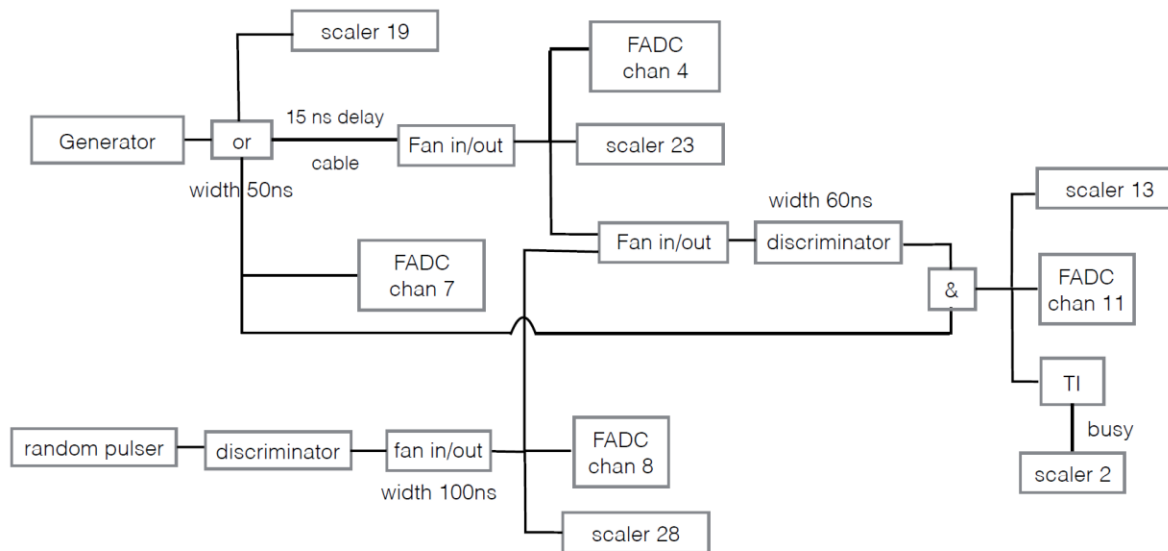# PVDIS trigger and readout
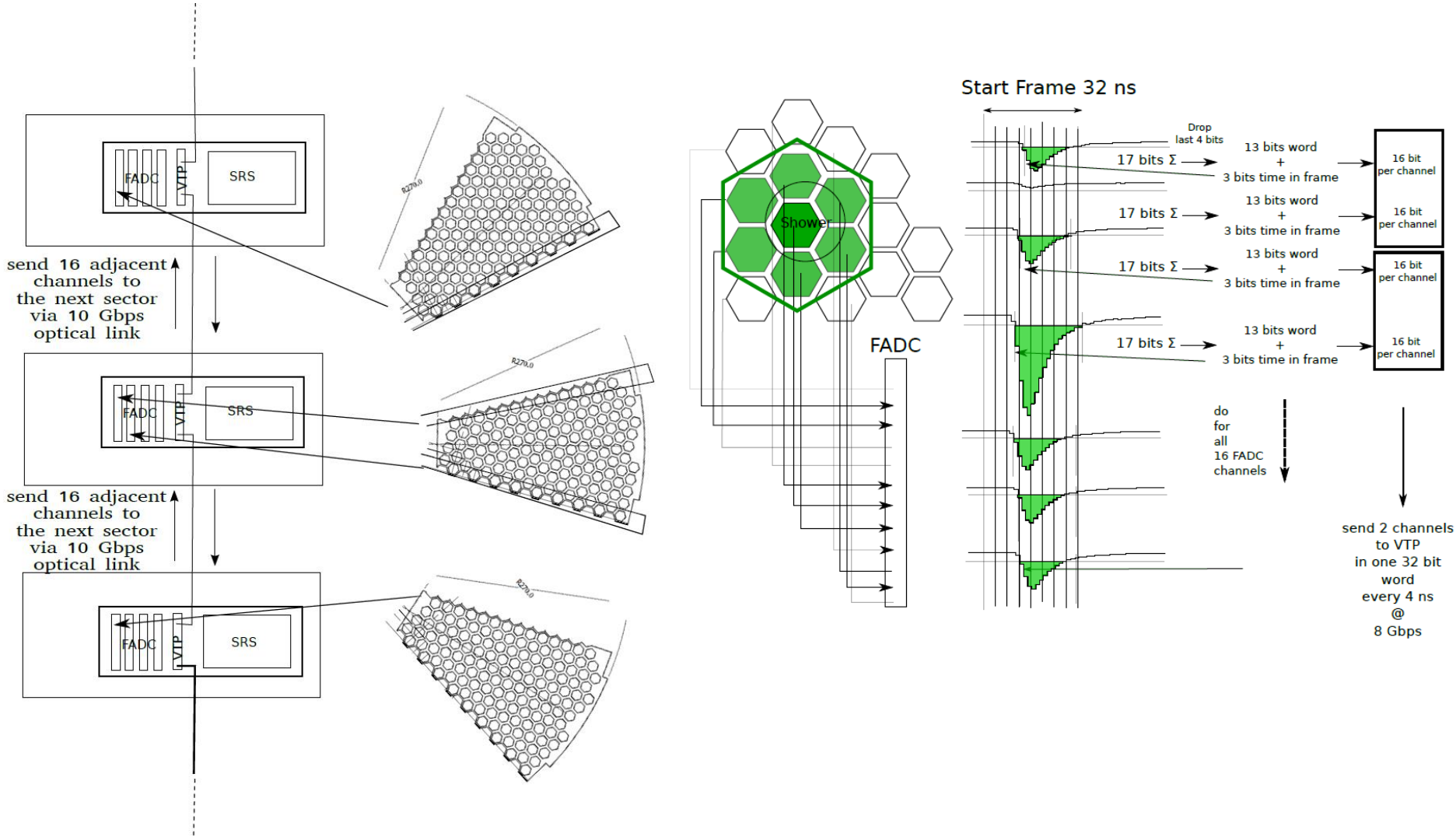
Crate layout
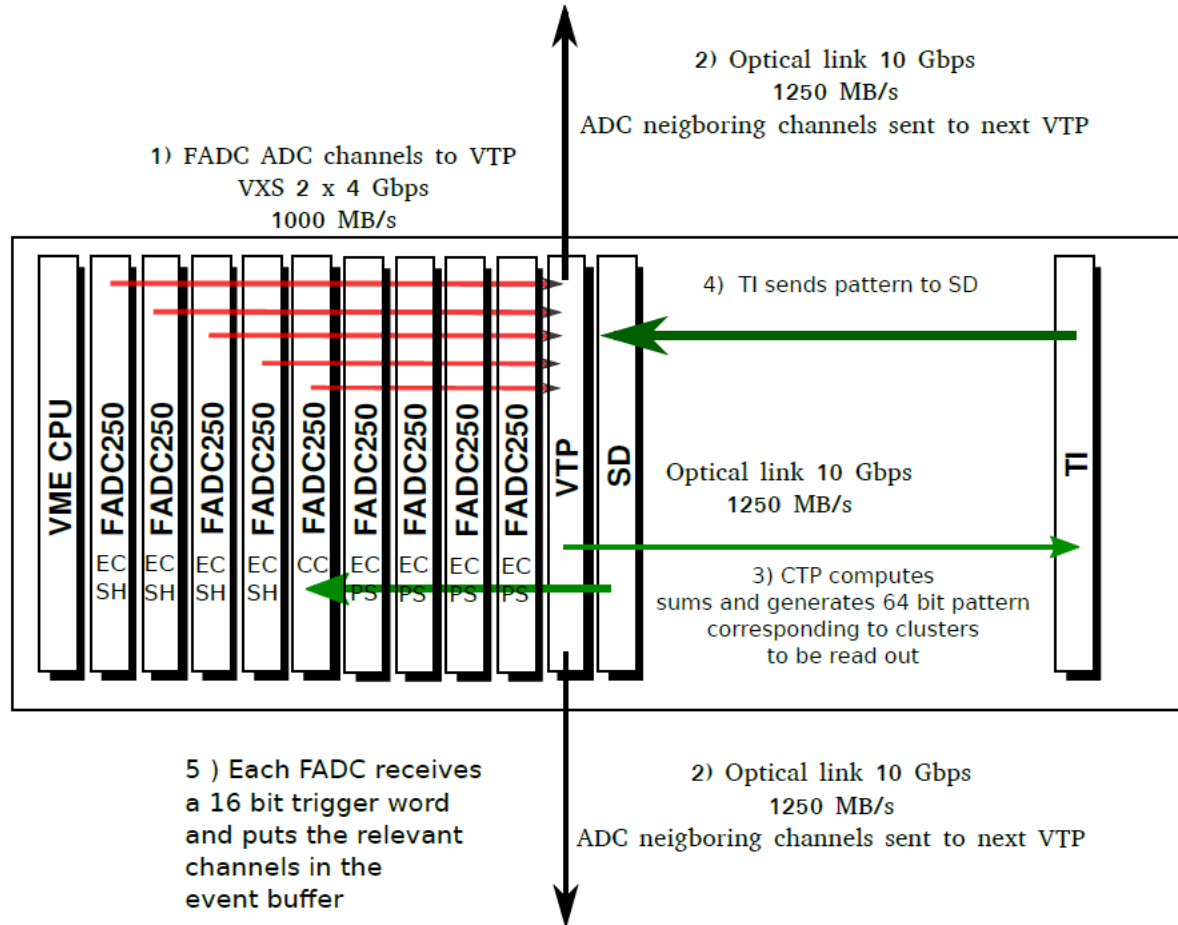
Compton single FADC setup
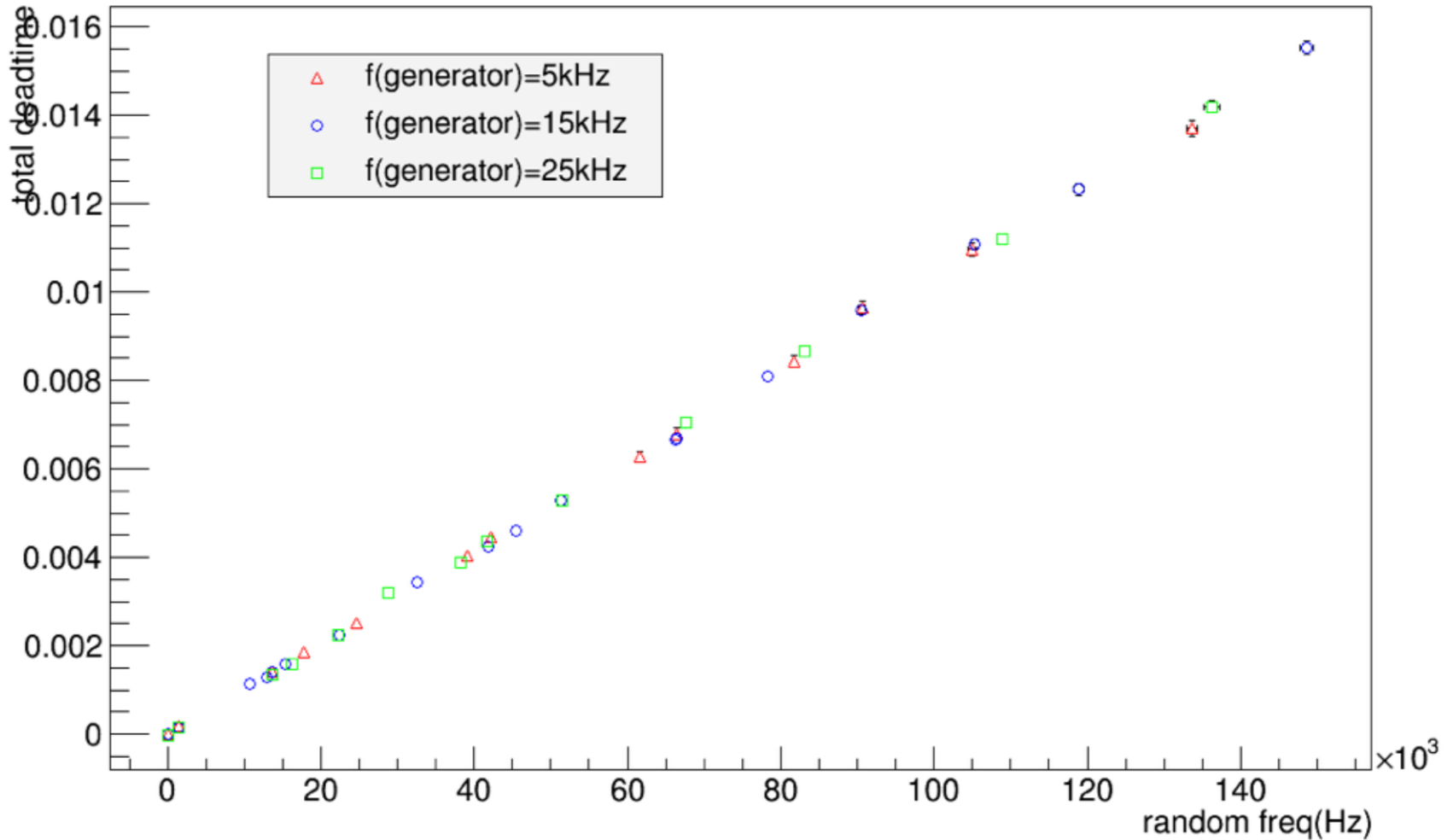
- PVDIS deadtime measurement setup

$$Deadtime_{total} = 1 - (1 - p)\frac{N_{fadc11}}{N_{scaler19}}$$

p: pile up

1. close random pulser, record the time difference between FADC 11 and FADC 7, t_0
2. open random pulser, count the number of events that the time difference between FADC 11 and FADC 7 is smaller than t_0, as N_1;
3. $p = N_1/(N_{fadc11} - N_1)$

Deadtime measurement with setup

total deadtime vs frdm

Deadtime measurement

- TS helicity gated dead time implemented
- FADC scalers
- External scalers

- Measure accuracy and model deadtime in raw mode 10 samples (Ed)

- Measure PVDIS asymmetry with FADC Compton setup (need borrow a TS to test helicity gated deadtime)
- Results for November/December SoLID science review