Preliminary Results for NDL sensors at DESY Testbeam

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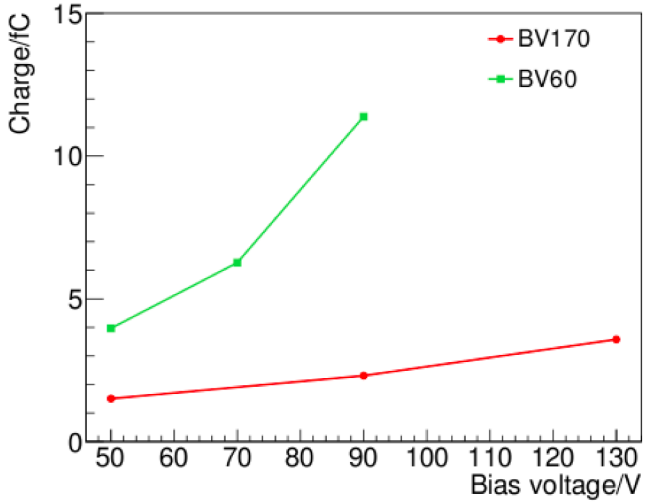
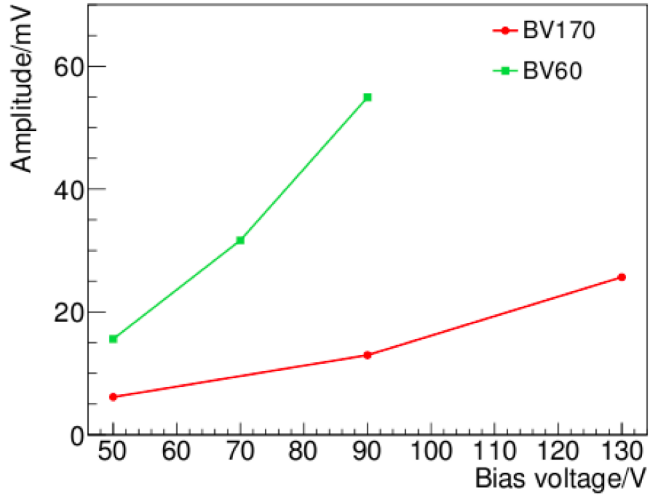
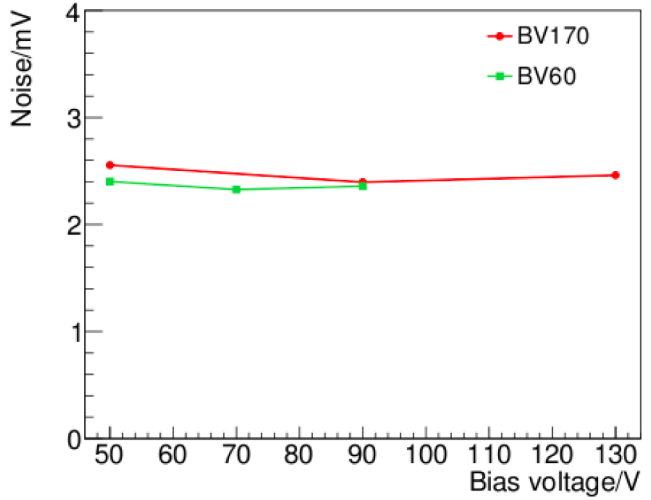
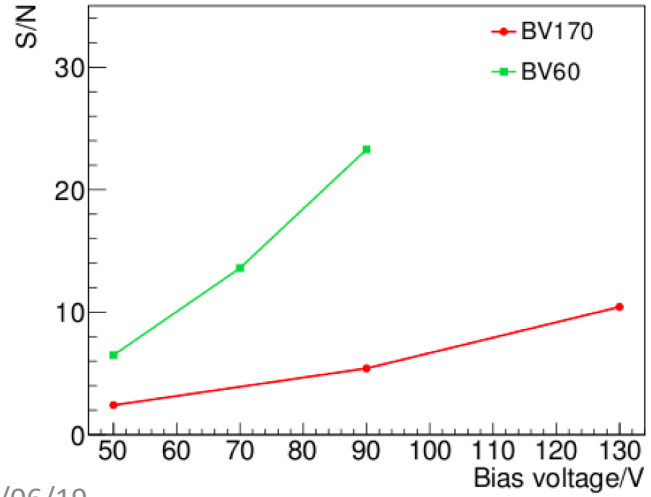
Preliminary Results for Testbeam









- Charge and amplitude are fitted by langaus function.
- Noise is fitted by gaus function.
- S/N is got by Amplitude/Noise.

Time resolution calculation

https://gitlab.cern.ch/atlas-hgtd/TestBeam/PyAna/blob/master/Macros/Q_getResoExample.py

- Two 3*3 matrix needed
  - One for sigma
  - Another for sigma error

- For our case

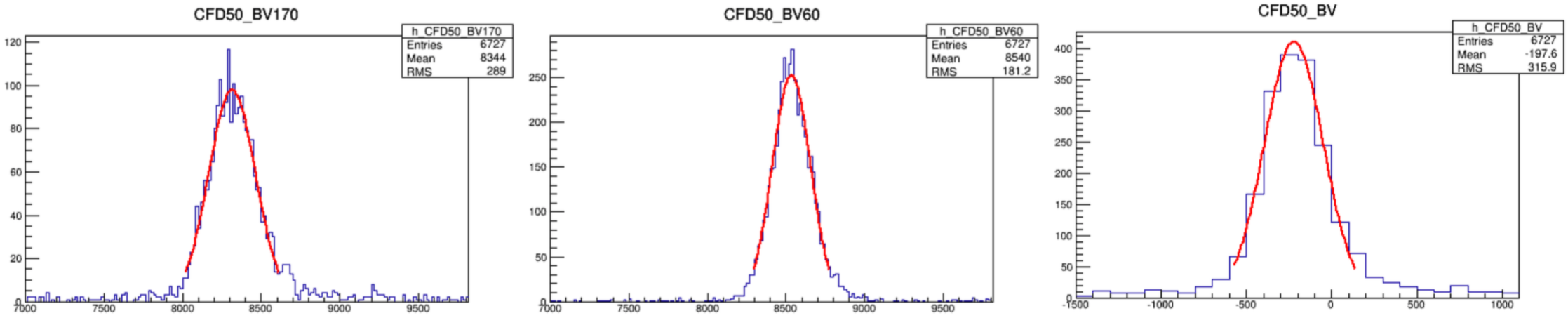
Studied sensors | Reference sensor

		0	1	2	3
Sensor		LGA35	BV170	BV60	SiPM3
Bias Voltage	101	190	50	50	26.5
	102		90	70	
	103		130	90	

  - Sigma of BV170-BV60, BV170-SiPM3, BV60-SiPM3 are needed

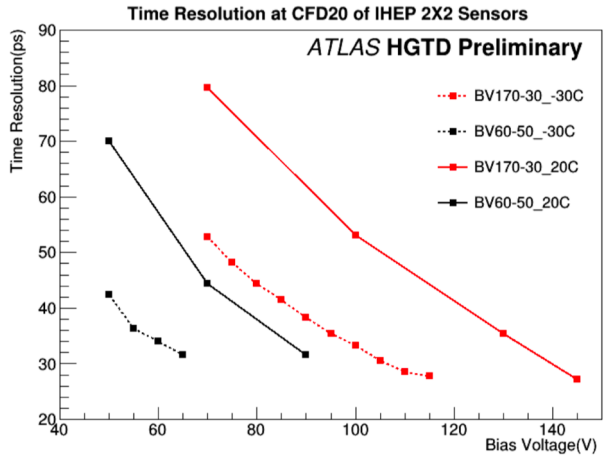
Time resolution calculation

- 10mV cut is applied to get time resolution.
  - Take batch 101 for example. Mean+-3*sigma region is taken to fit a Gaussian shape.



Time resolution result

- NDL sensor time resolution is ~30ps in Beta source test.



result by SCIPP

https://indico.cern.ch/event/816136/contributions/3406686/attachments/1847467/3031646/IHEP_2x2_Test.pdf

- Time resolution for SiPM used in DESY testbeam is ~65ps, which is diffecult to test NDL sensor time resolution.

my result

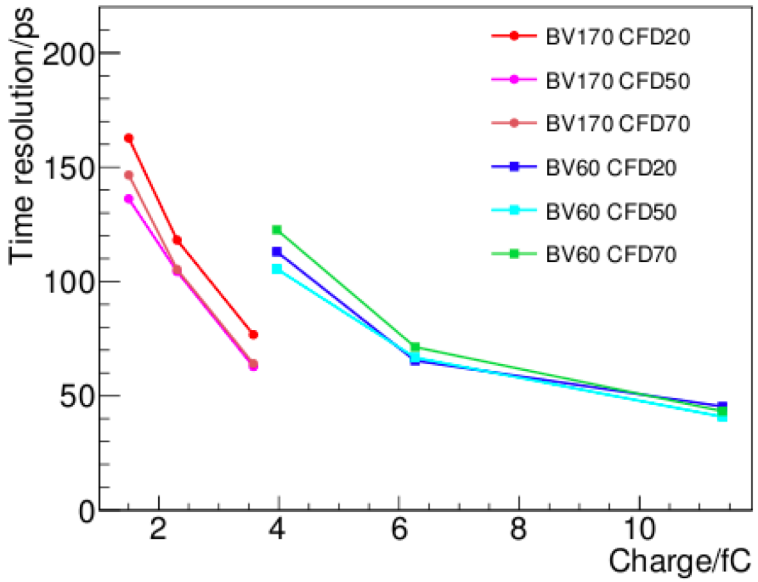
	Voltage	CFD	σ[ps]
May SiPM3	26.5	20	66.66 +- 7.46
		50	65.02 +- 4.80
		70	62.21 +- 6.70

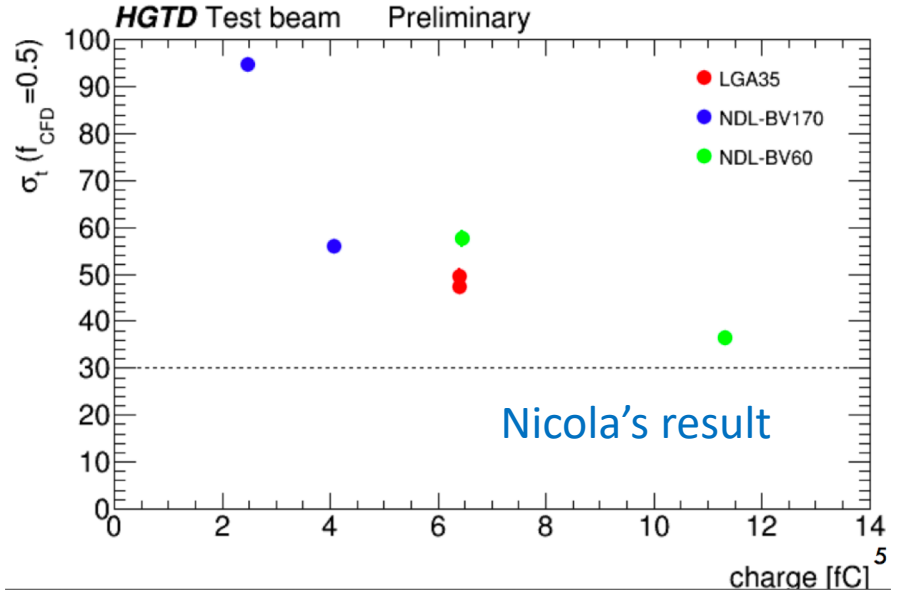
SiPM time resolution

	Voltage [V]	σ(CFD 0.2) [ps]
March SiPM	27.8	39. ±2.2
May SiPM2	27.6	63.3±0.9
May SiPM3	27.6	71.8±1.3

Nicola's result

Time resolution result





- SiPM with ~65ps resolution cannot help test NDL sensor.
- Result shows good consistence with Nicola's result.

Thanks for your attention!

Back-up

- Time resolution v.s. Bias voltage