

Mupix8 Powering Results in Lab

Thomas Rudzki, Powering Meeting Heidelberg, 29 X. 2019



Settings

1. MuPix8 on insert_light; **standard motherboard**
2. MuPix8 on insert_light; **no-filter motherboard, externally powered**
3. MuPix8 on insert_light; no-filter motherboard, **VDD powered via DC-DC**
4. MuPix8 on insert_light; no-filter motherboard, **VDDA powered via DC-DC**
5. MuPix8 on insert_light; no-filter motherboard, **VDD & VDDA powered via DC-DC (shorted)**



Changes to make setup running

Only change:

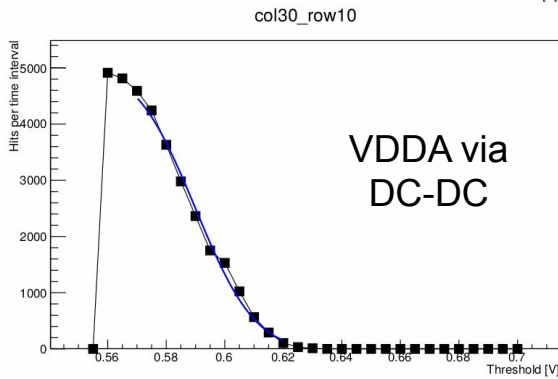
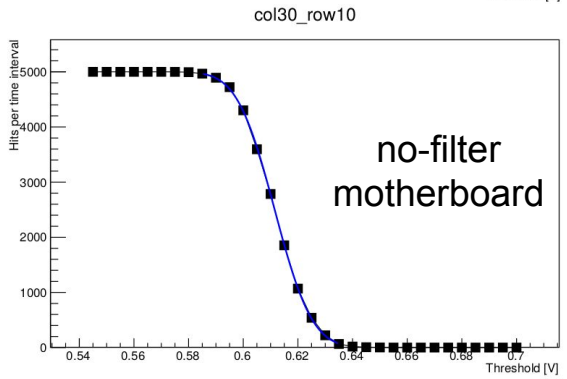
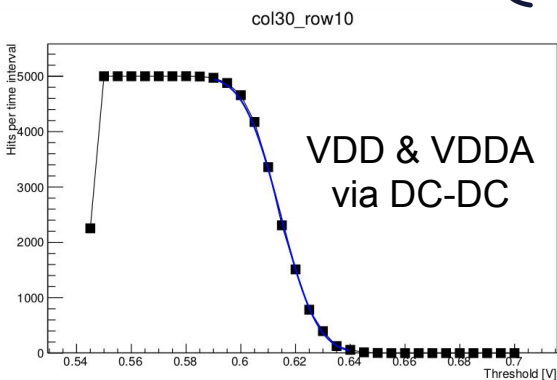
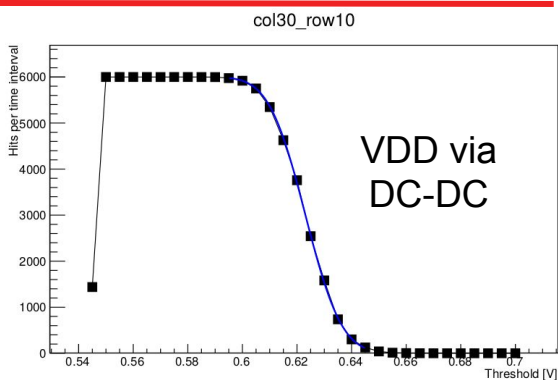
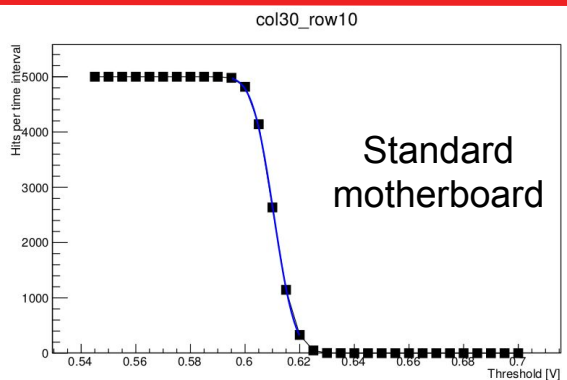
VPVCO = c \Rightarrow VPVCO = 18

VNVCO = d \Rightarrow VNVCO = 19

Setup working in all configurations presented before

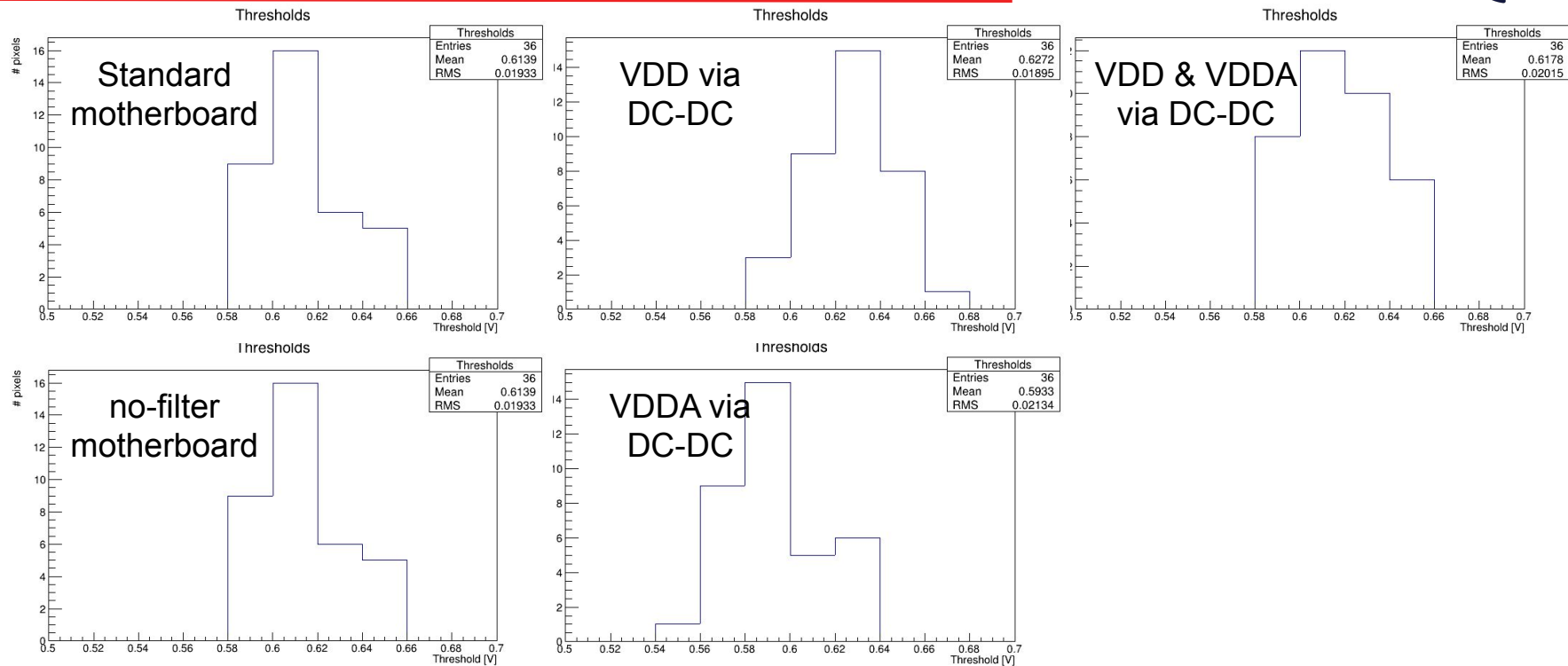


Exemplary S-Curves



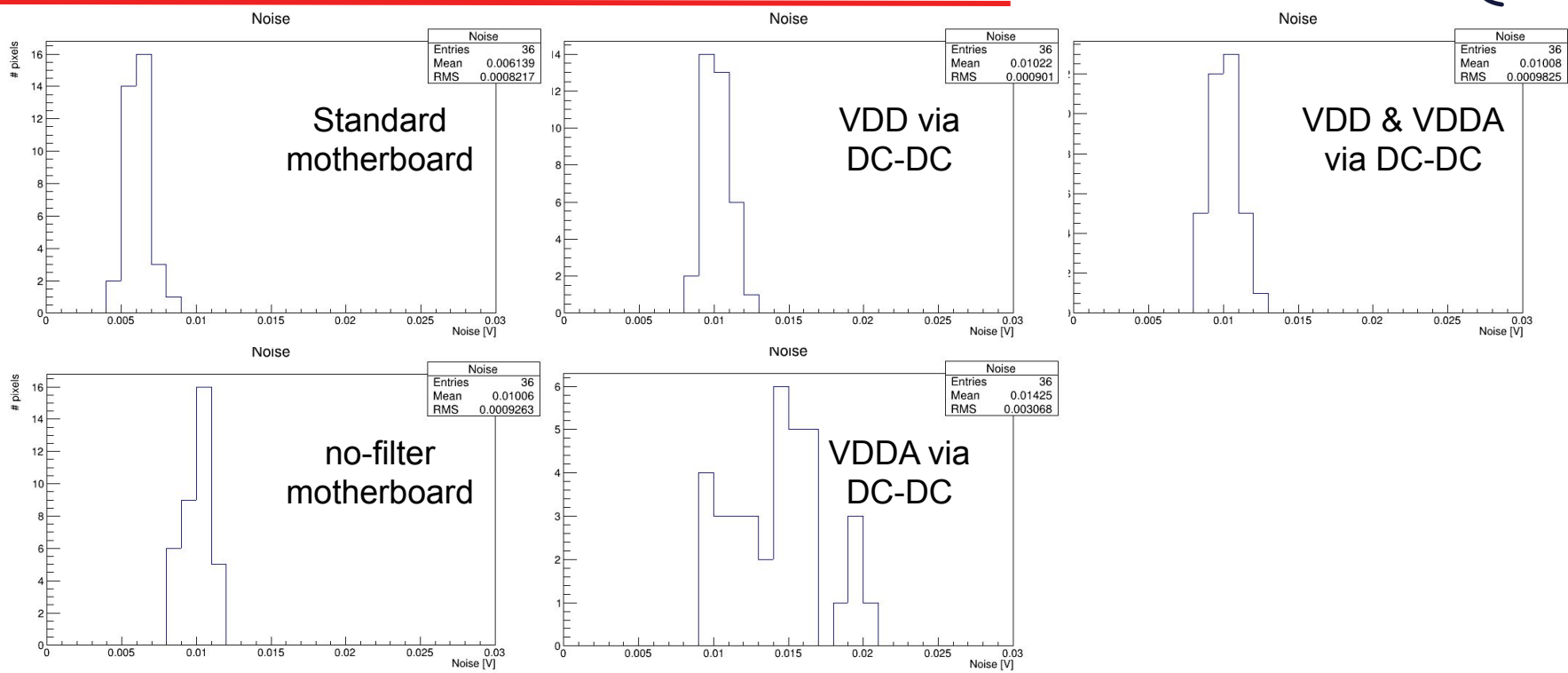


Signal strength





Noise





Eye Diagrams - Jitter

Settings	RMS Jitter
1.) Standard motherboard	37.15 ± 0.01 ps
2.) no-filter motherboard	43.16 ± 0.02 ps
3.) VDD via DC-DC	43.81 ± 0.05 ps
4.) VDDA via DC-DC	41.41 ± 0.01 ps
5.) VDD & VDDA via DC-DC (shorted)	54.87 ± 0.03 ps

Influenced by grounding

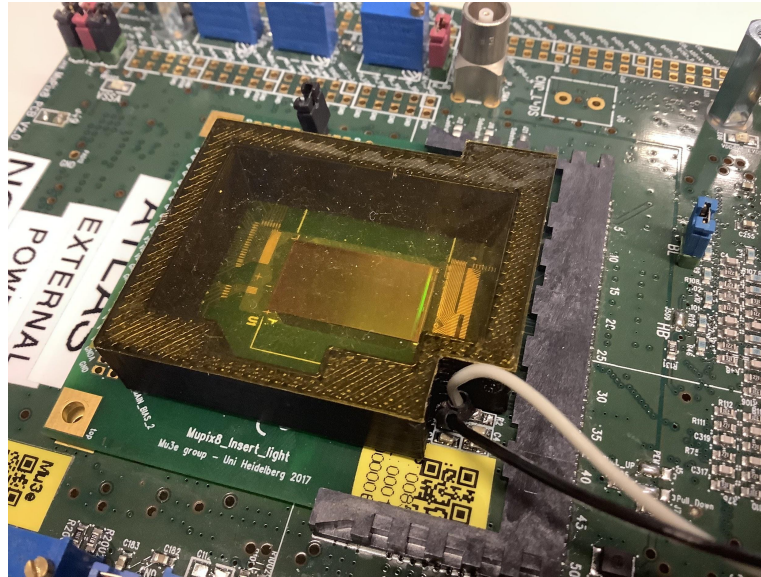


Eye Diagrams - Jitter

Using 85-1-1 sensor (NOT 1 kOhm)

Settings	RMS Jitter
1.) Standard motherboard	
2.) no-filter motherboard	42.92 ± 0.01 ps
3.) VDD via DG-DG	
4.) VDDA via DC-DC	48.32 ± 0.01 ps (grounding I) 54.41 ± 0.01 ps (grounding II)
5.) VDD & VDDA via DC-DC (shorted)	50.54 ± 0.01 ps (grounding I) 57.88 ± 0.01 ps (grounding II)

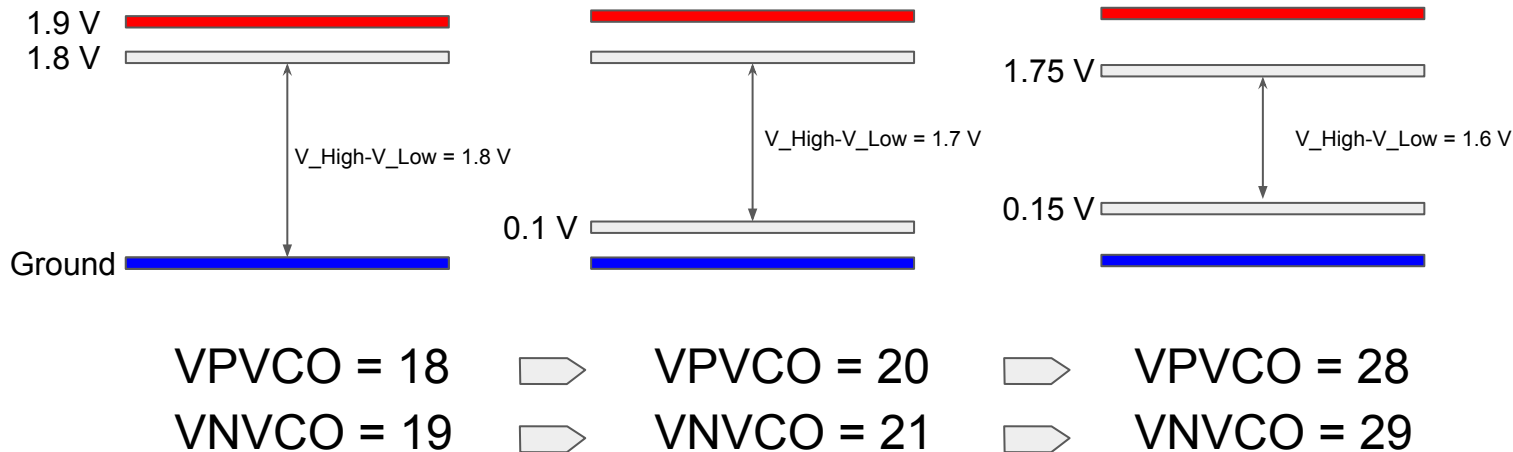
Decoupling V_High and V_Low





Decoupling V_High and V_Low

V_High and V_Low were provided externally in following configs:





Settings

DC-DC board:

- Switching frequency = 1 MHz

LV:

- VDD: @HAMEG = 1.925 V; @board = 1.880 V
- VDDA: @insert_{HAMEG} = 1.860 V; @insert_{DCDC} = 1.878 V
- VSSA: @insert = 0.970-0.978 V

HV:

- In all tests at - 40 V



	VDD (board)	VDDA (insert)	VSSA (insert)