

DCD Testing

In Bonn

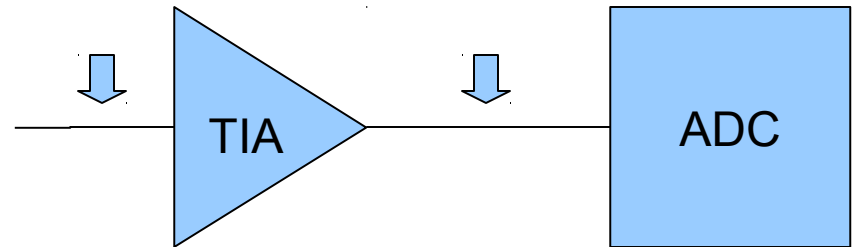


DCD measurements in Bonn

- Hybrid 4.1 without matrix
- reproduced measurements from Mannheim
- AmpLow and RefIn voltage scan
- statistics run
- current source Keithley 2410
 - High accuracy but with high frequency noise
 - RC lowpass filter needed

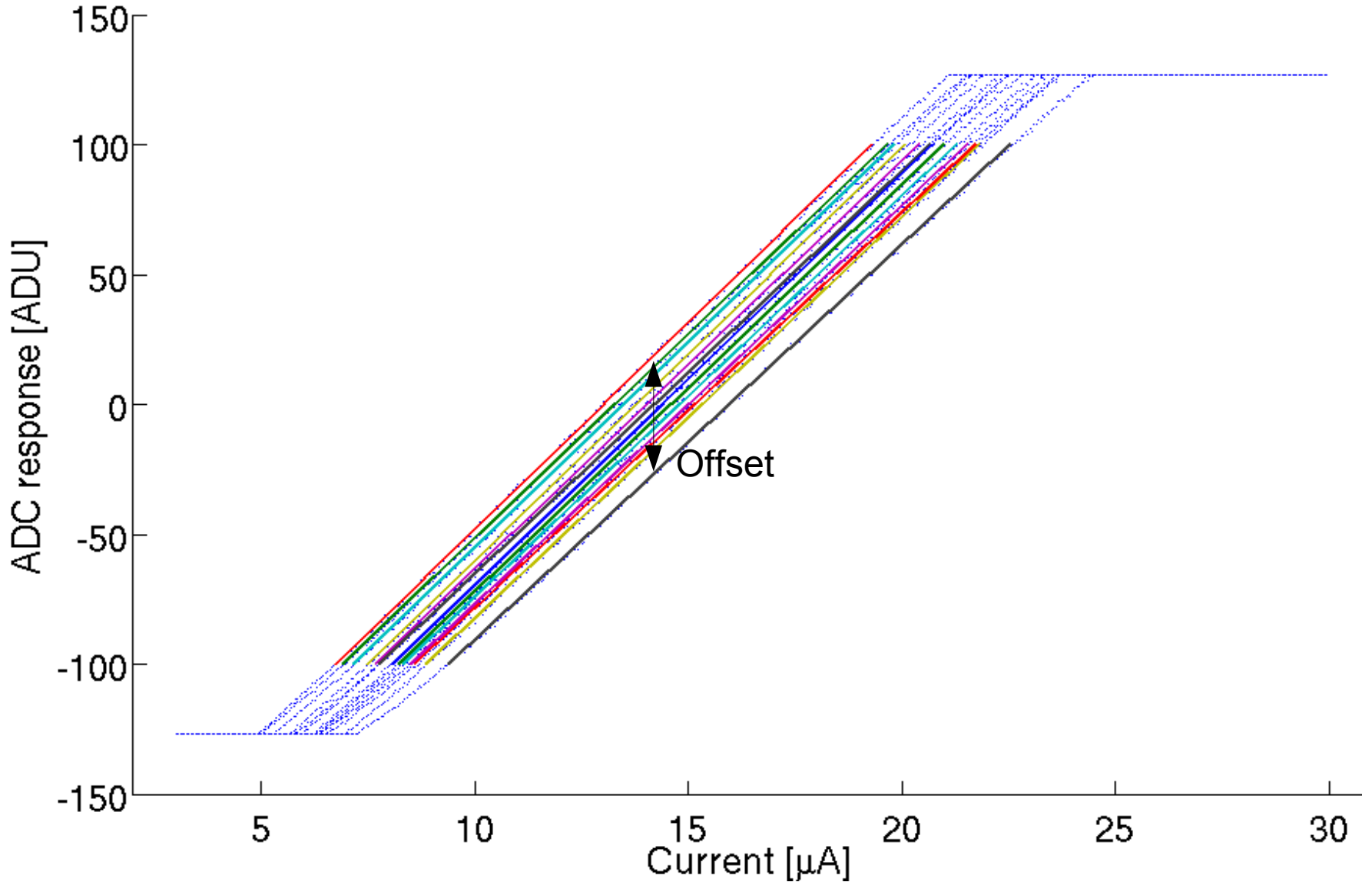
DCD

- Monitor Pad connected to all Pixels (selectable)
 - before TIA
 - after TIA
- DCDDRO is not controlled by FPGA at the moment
 - Column 2 – 5 readable
 - 128 Pixels with 256ADCs (left and right)

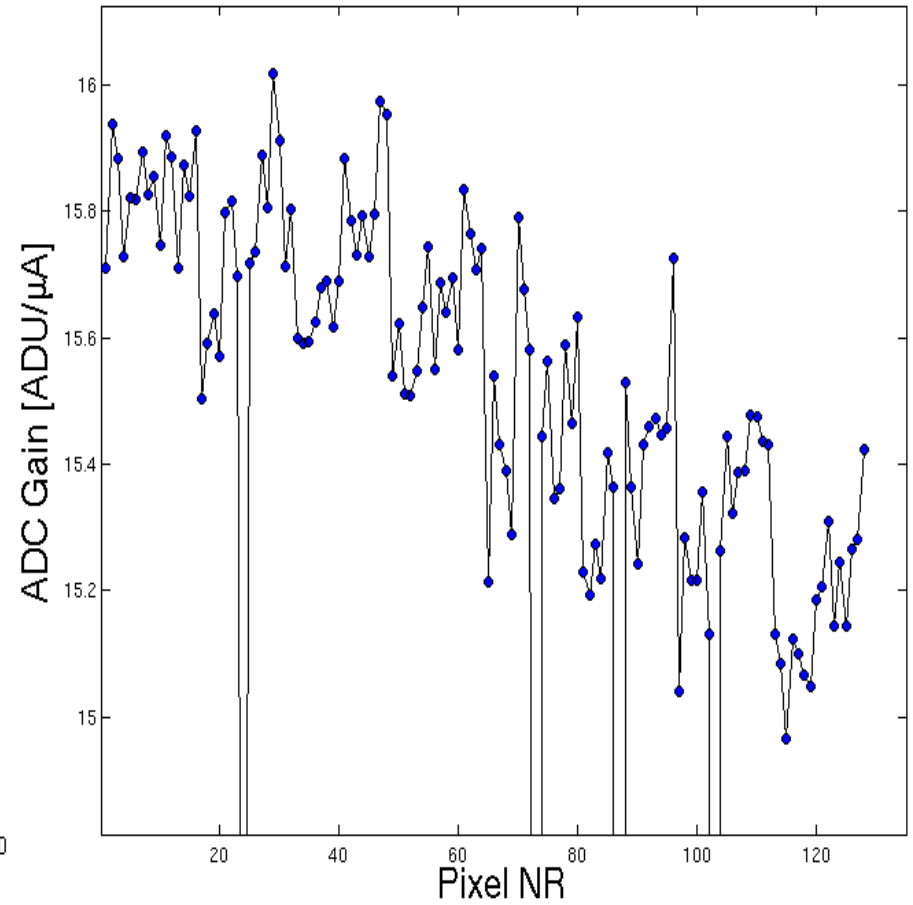
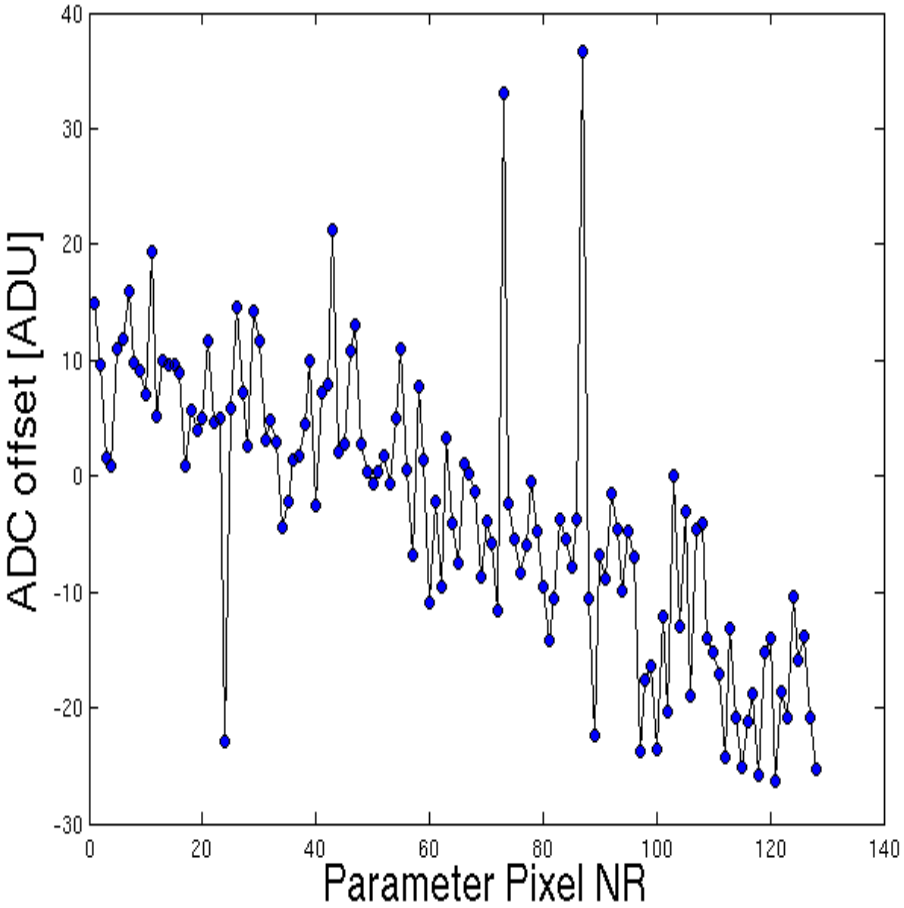


First statistics Run

ADC vs Input current, scan; All Pixel Scan

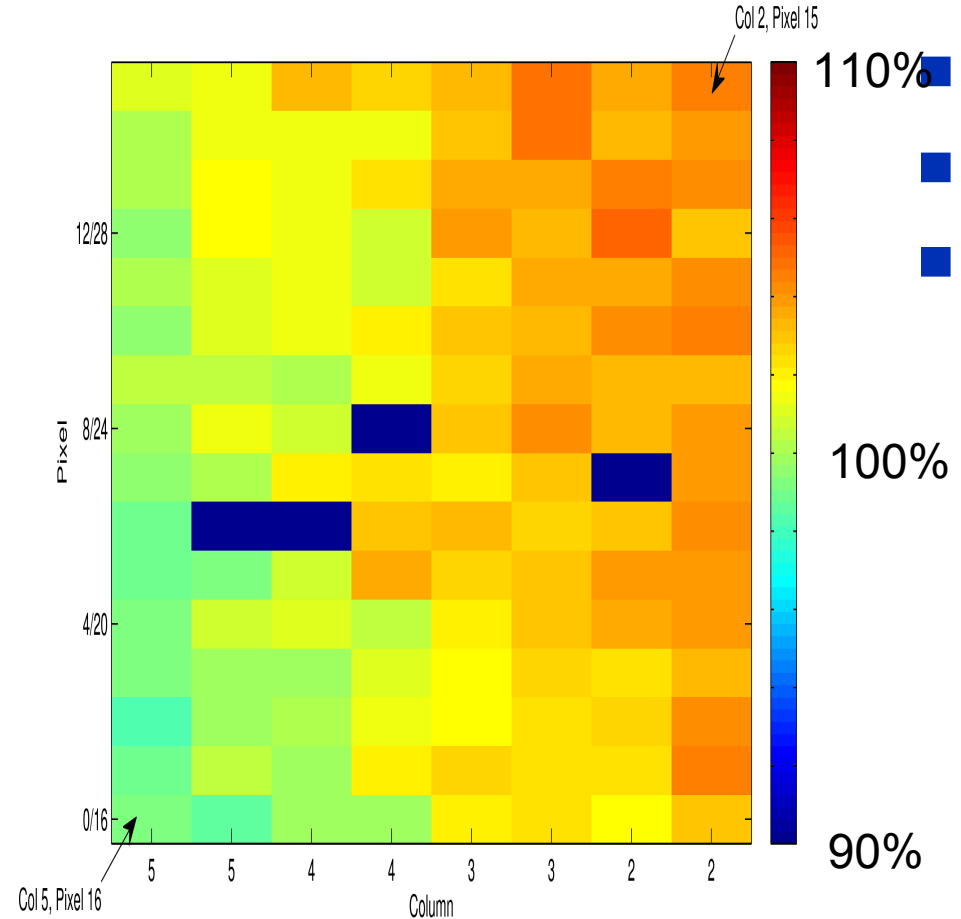


Offset and Gain



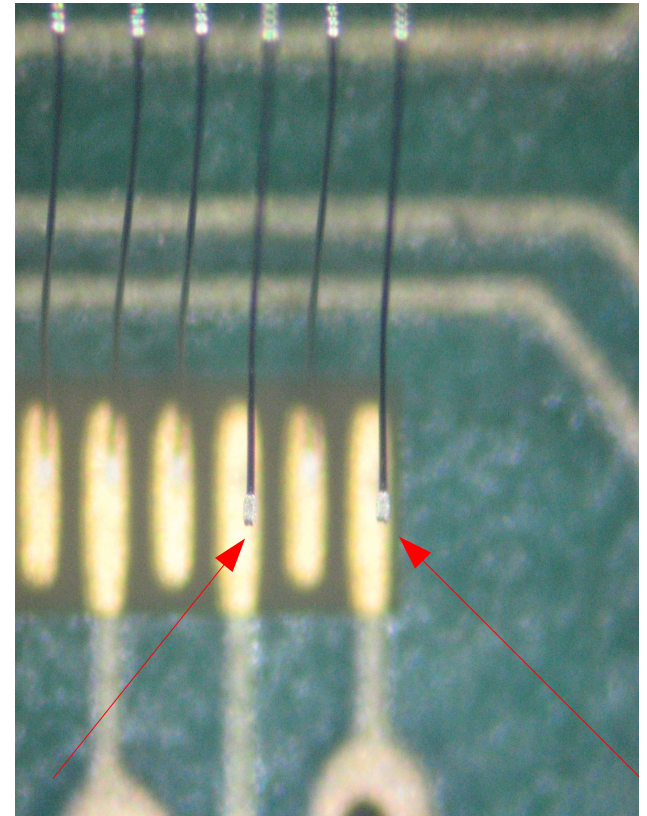
Gain vs Pixel position

- unexpected Gradient
- expected Gradient from up to down
- overlap of two Gradients?

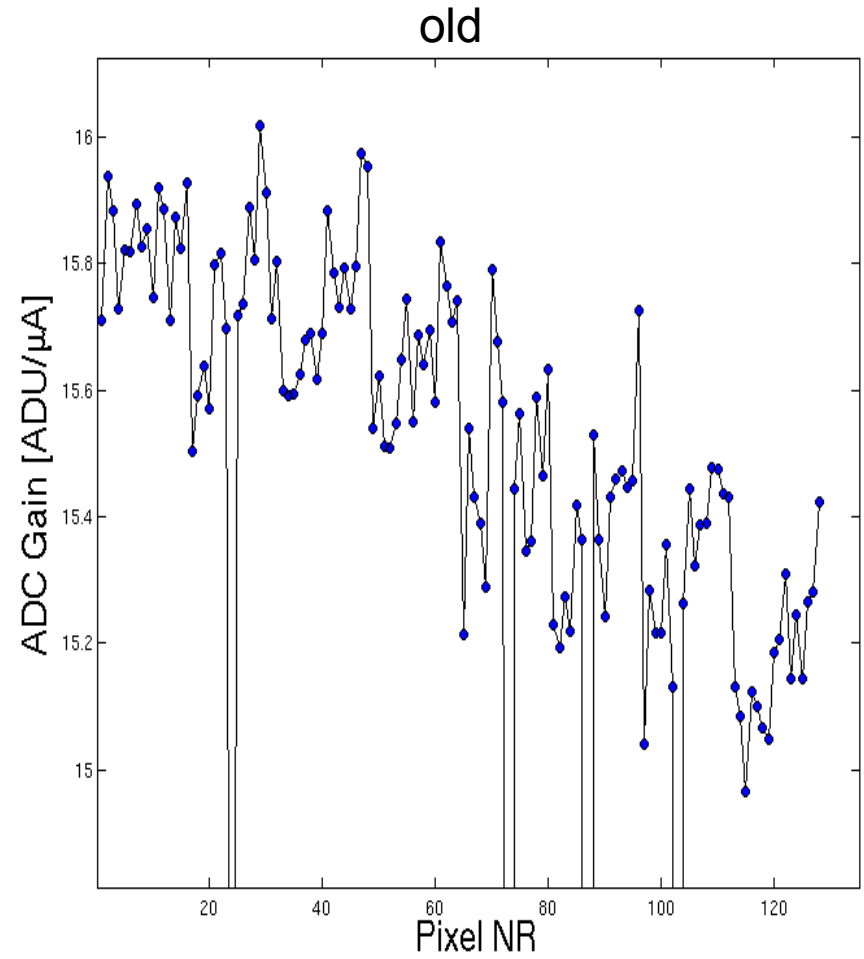
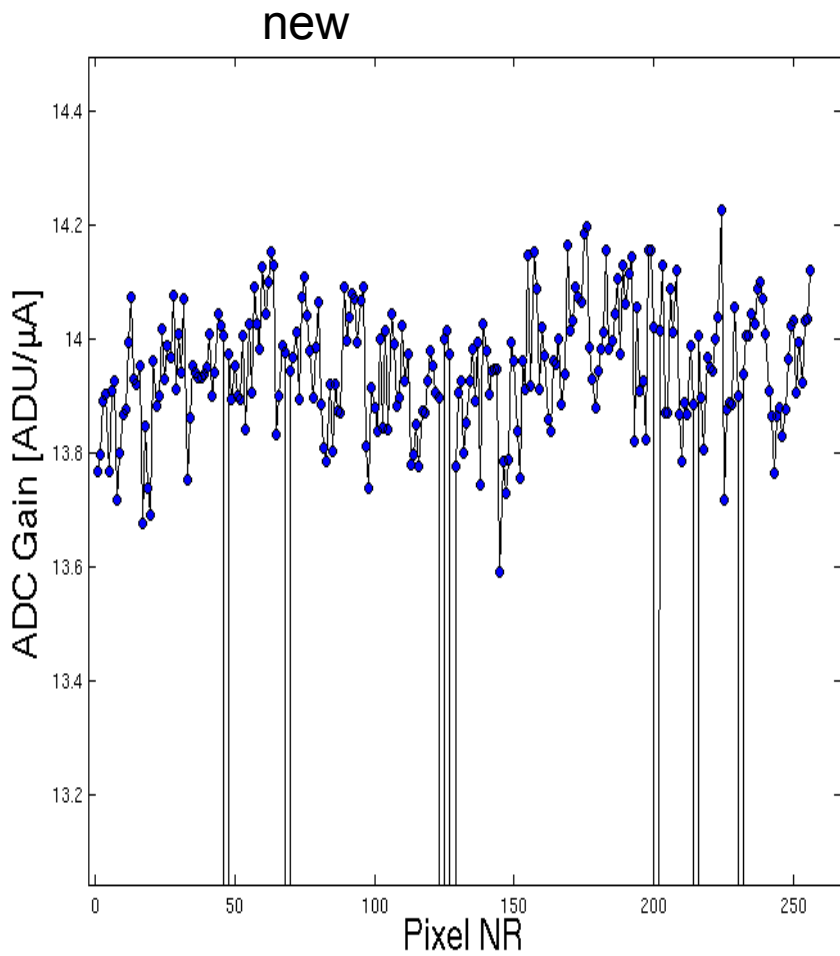


Why is there a gradient?

- Two loose bonds
 - VDDA
 - GNDA
- Analog power only supplied from one side
Voltage gradient!



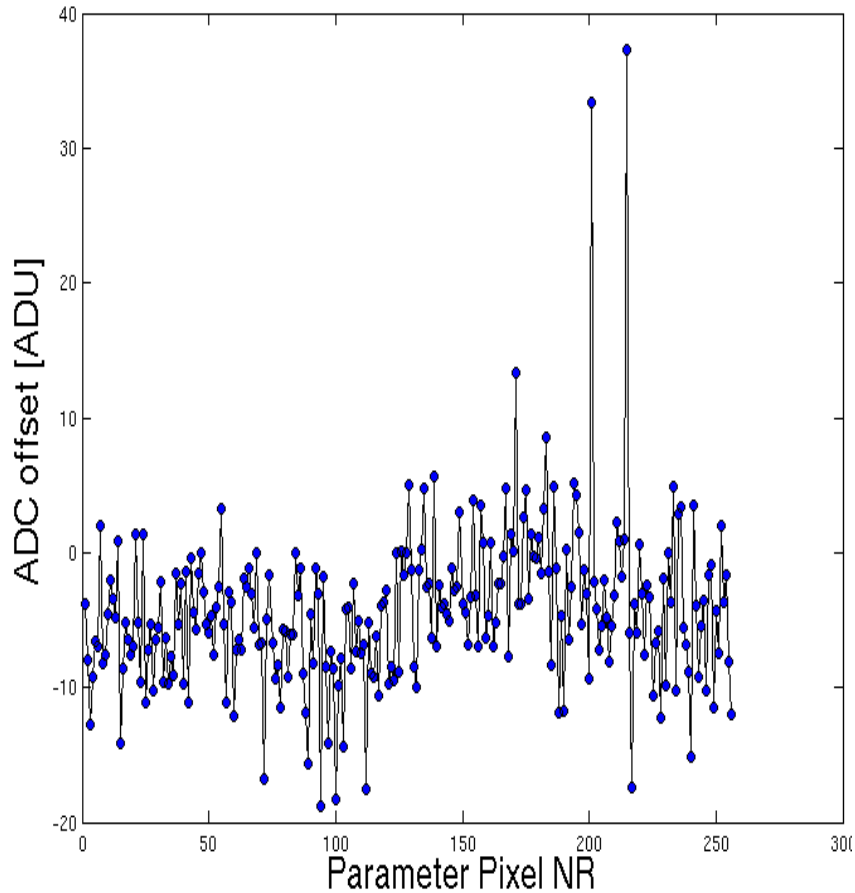
Result of repaired bonds



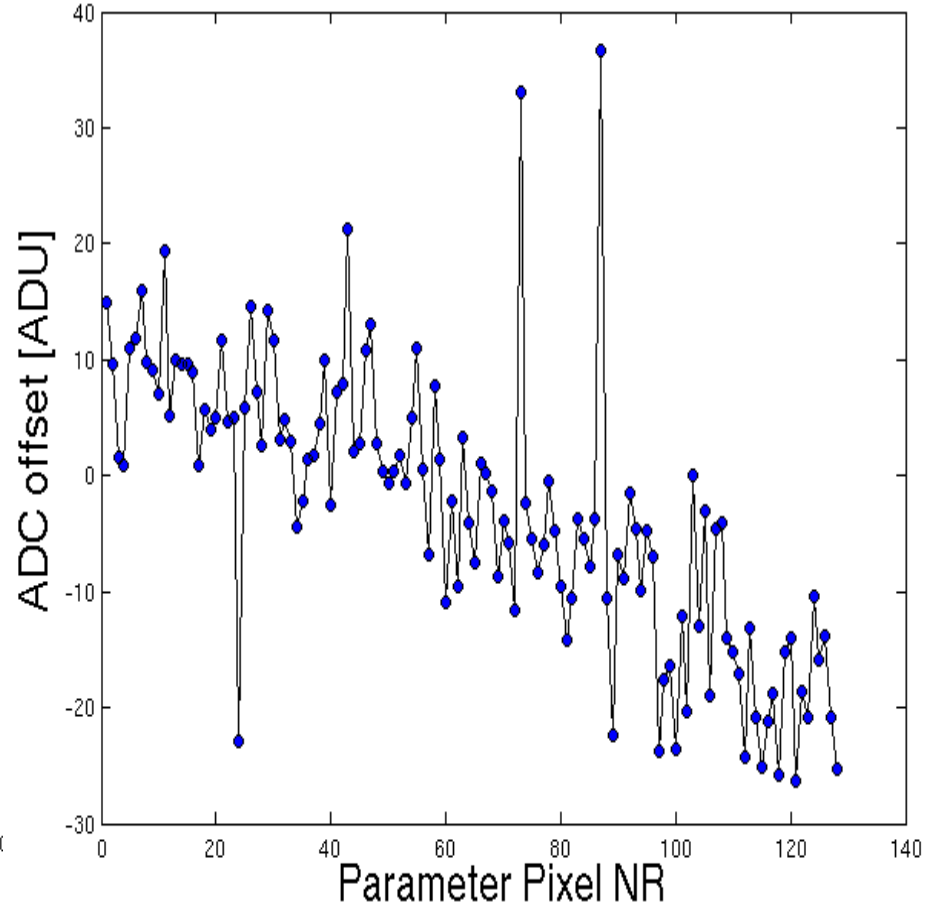
Result of repaired bonds



new

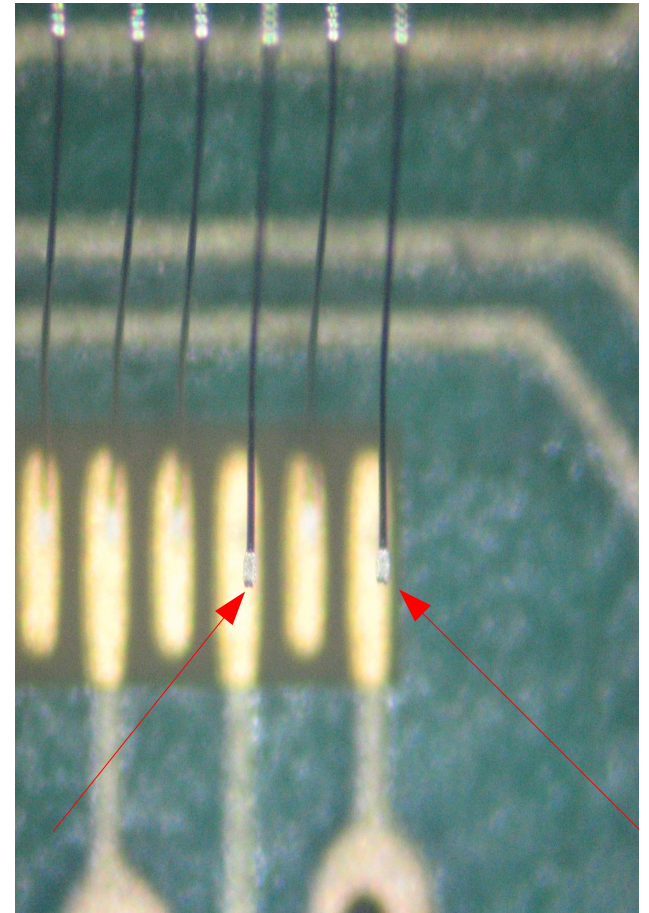


old



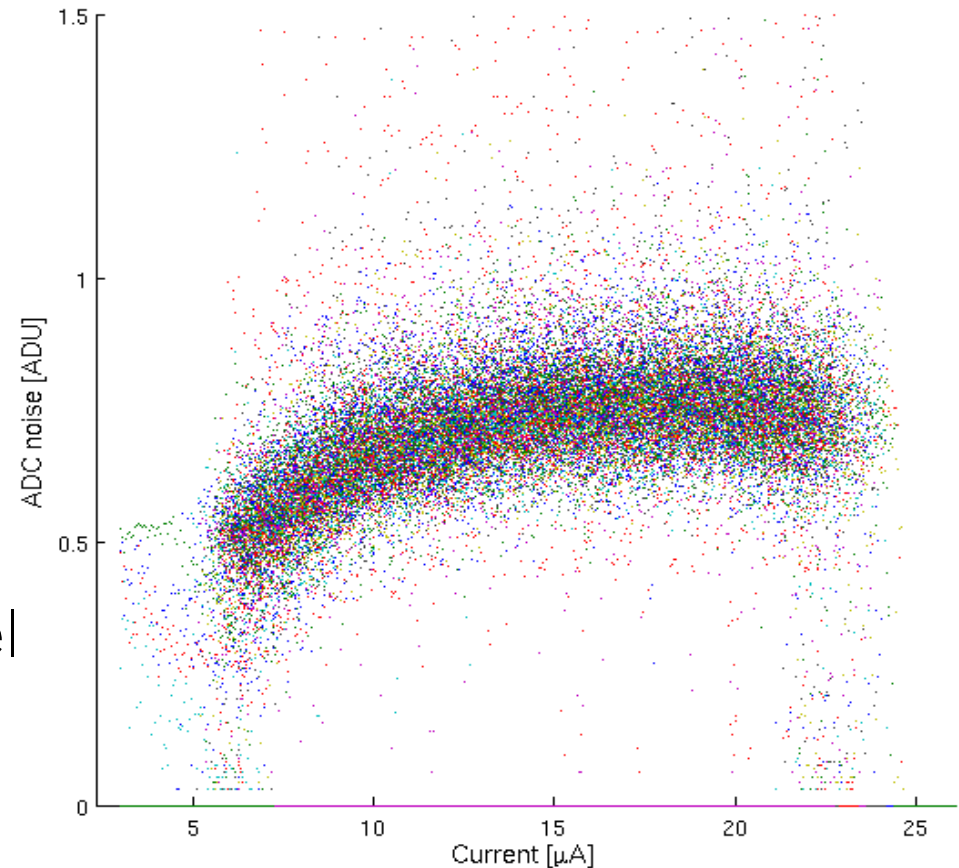
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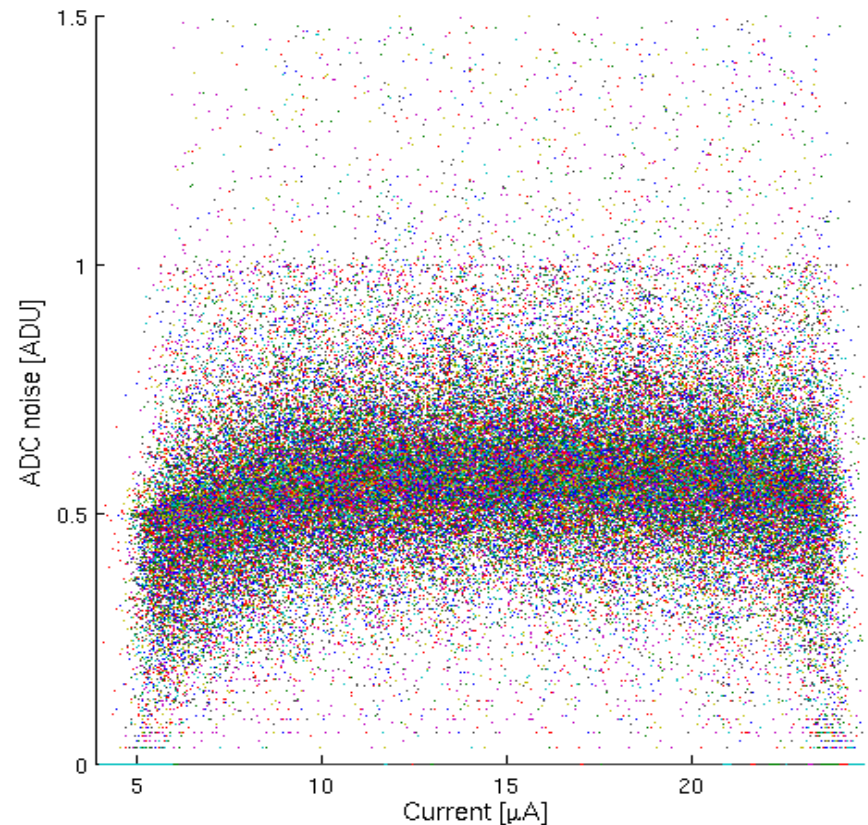
Noise of first Statistics Run

- With filter
- 128 ADCs (only left)
- 50nA Steps
- 1000 measurements /step
- No exclusion of nonworking channel



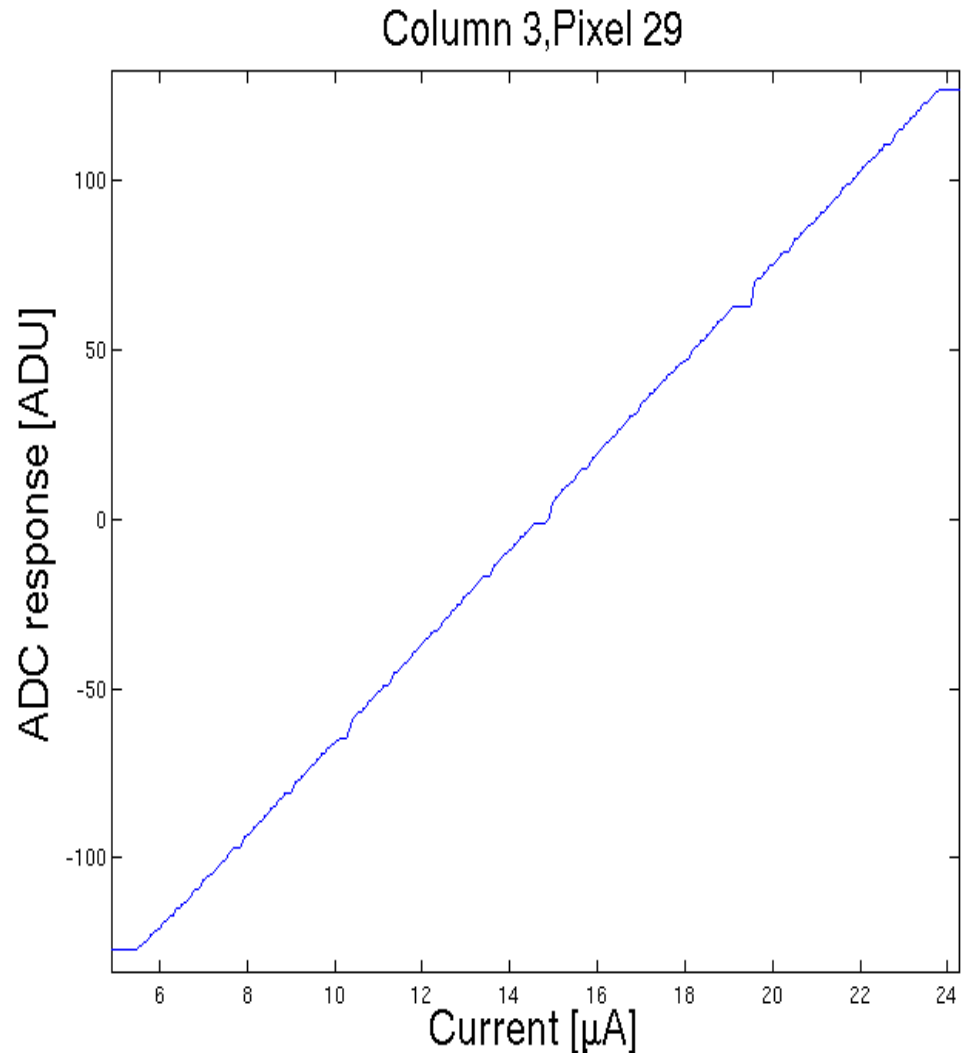
Noise after fixing wirebonds

- With filter
- 256 ADCs (left and right)
- 50nA Steps
- 1000 measurements /step
- No exclusion of nonworking channels



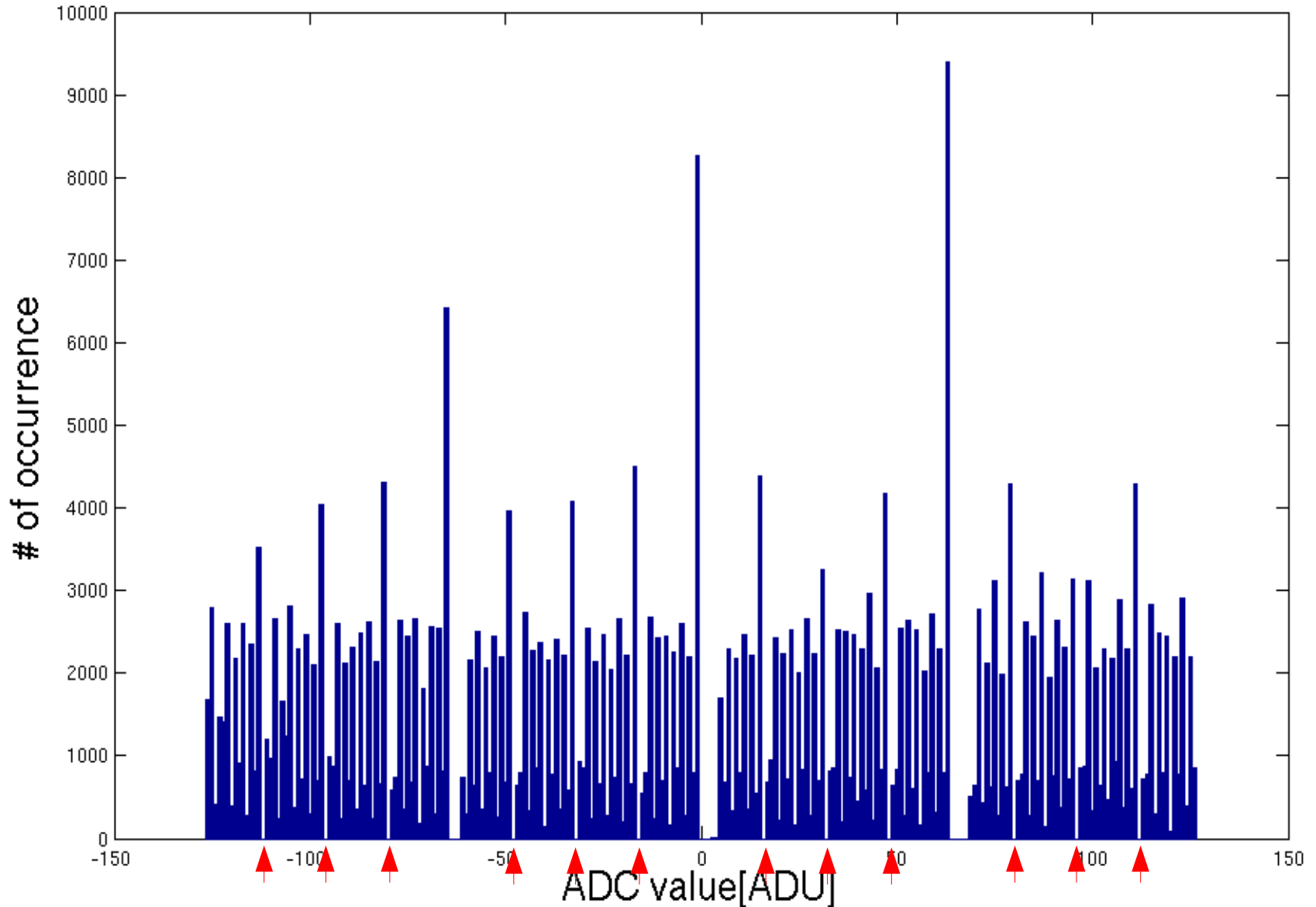
Why is there a step in the noise?

- High noise up to one
- Possible cause: Steps in ADC curve
- Small input noise, only few bins hit
- Example: value n is missing
 - Measurement gives $n+1$ and $n-1$
 - Equally distributed: Noise of 1



Why is there a step in the noise?

Column 3, Pixel 29



Questions?

