



RD53B Vcal_Med to ground injection results

Thanks to Maurice Garcia-Sciveres, Timon Heim and Magne Lauritzen

Presented by Simon K. Huiberts

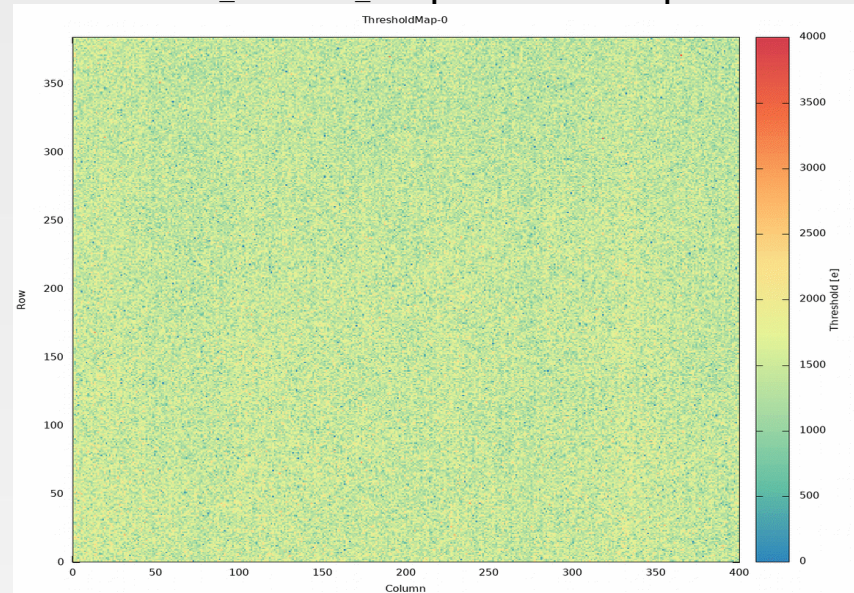




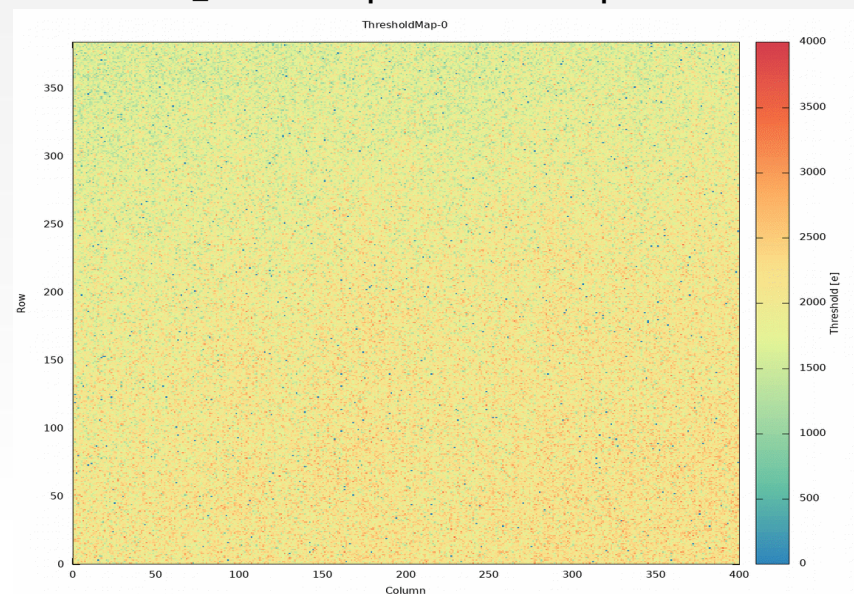
Method

- 1) Perform a standard threshold scan with injections going from Vcal_Hi to Vcal_Med
- 2) Then we do another threshold scan with injections from Vcal_Med to GND
 - Get two threshold maps containing the threshold value for all pixels
- 3) Take the first threshold map and subtract it from the second threshold map
 - Subtraction is done pixel by pixel
 - I.e. words: threshold value for pixel [0,0] gets subtract it from the second threshold value for pixel [0,0]
- As Vcal_Hi to Vcal_Med capacitor is set to inject the same amount of charge as Vcal_Med to GND
- Obtain the voltage differences of the two injections

Vcal_Hi to Vcal_Med pixel threshold Map



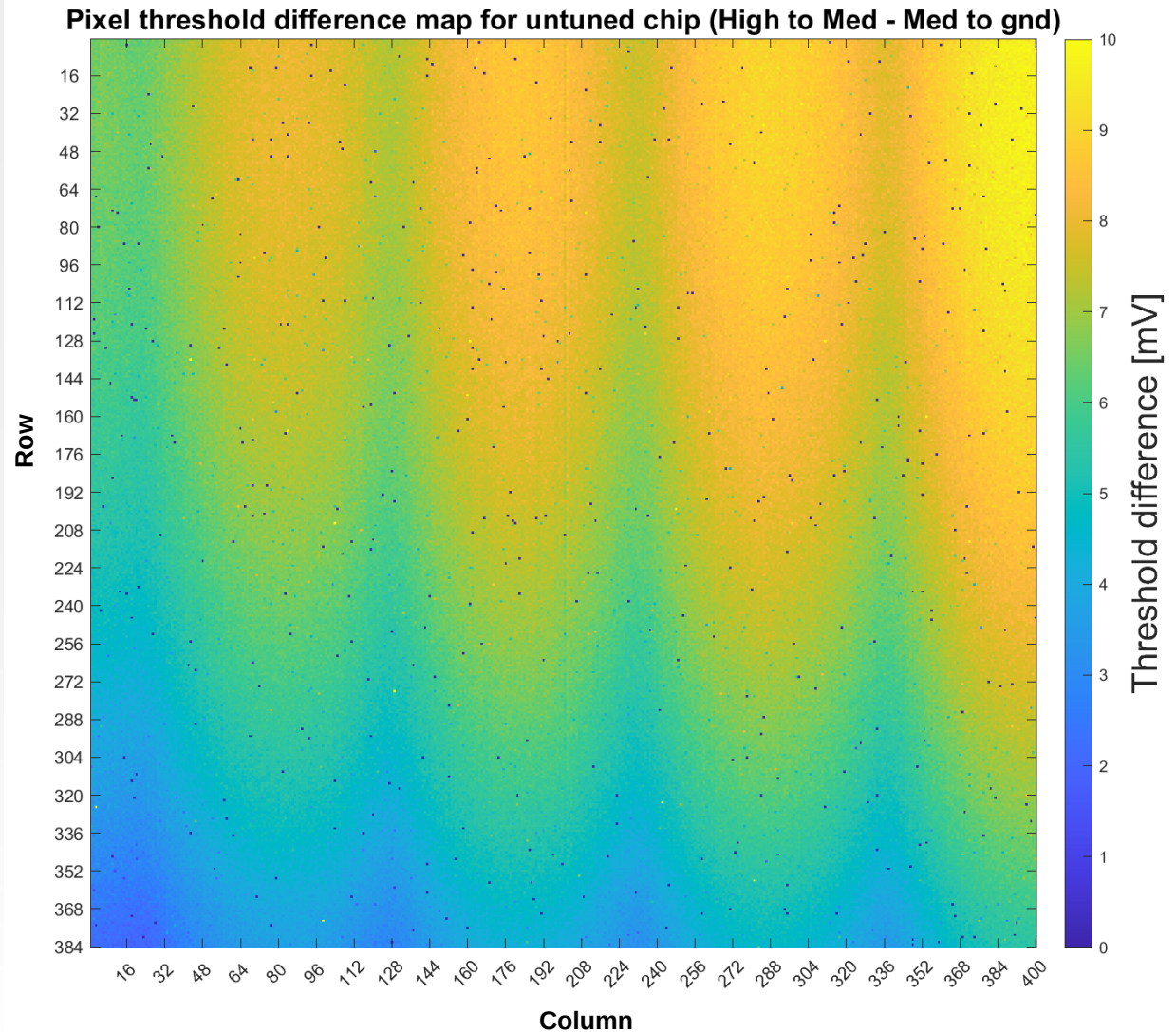
Vcal_Med to GND pixel threshold Map



Results for an untuned RD53B-chip



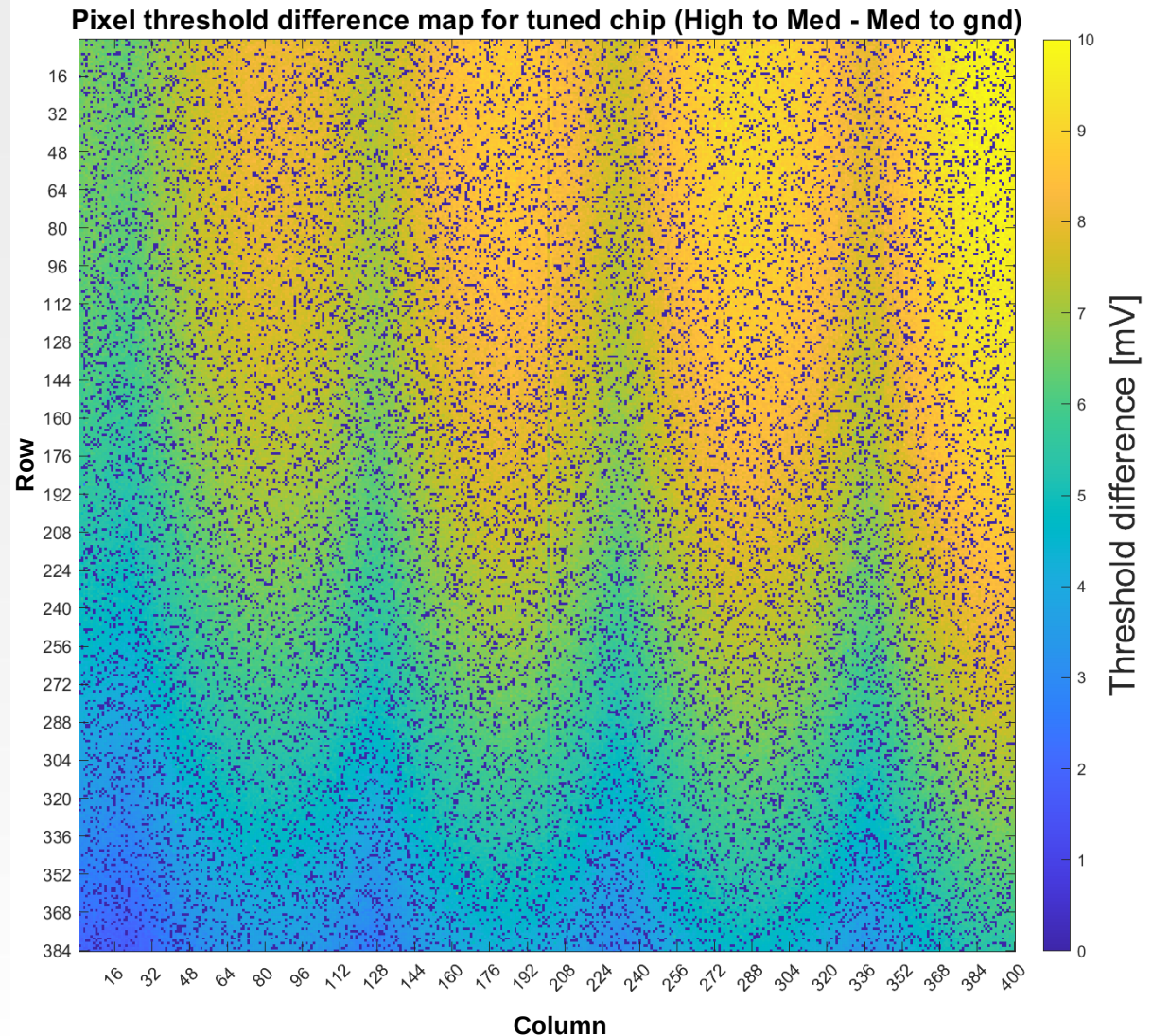
- Untuned RD53B chip
- ΔV_{cal} goes from 0 to 4000e (0 to 50mV)
- X-axis: Pixel columns
- Y-axis: Pixel rows
- Colourbar on map is the threshold difference in Millivolts [mV]
- Map shows the local ground potential differences
- Blue regions/lines have smaller voltage variations
- Also where the analogue ground pads/rails are placed
- Maximum voltage variation is 10-11 mV (top right corner)



Results for an tuned RD53B-chip



- Tuned RD53B chip
- Chip tuned to 1000e with Vcal_Hi to Vcal_Med
- ΔV_{cal} goes from 0 to 2000e (0 to 25mV)
- X-axis: Pixel columns
- Y-axis: Pixel rows
- Colourbar on map is the threshold difference in Millivolts [mV]
- Basically, get the same results: map shows the local ground potential differences
- Vary within the pixel matrix reaching also maximum voltage variation is 10-11 mV (top right corner)
- Snowflake pattern on top comes from communication errors after tuning (even with the latest YARR version)





Thank you for your attention!



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