3-sensor Ladder Survey

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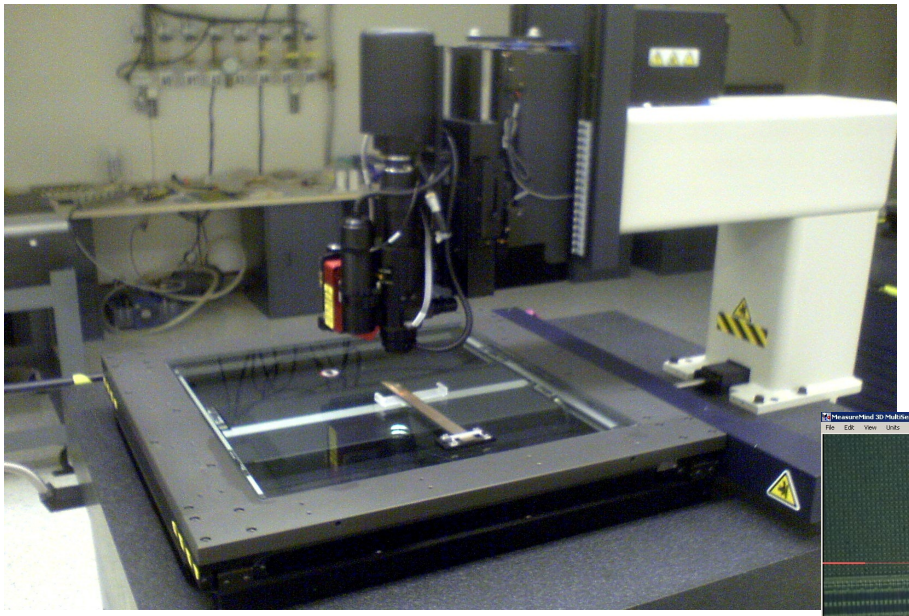
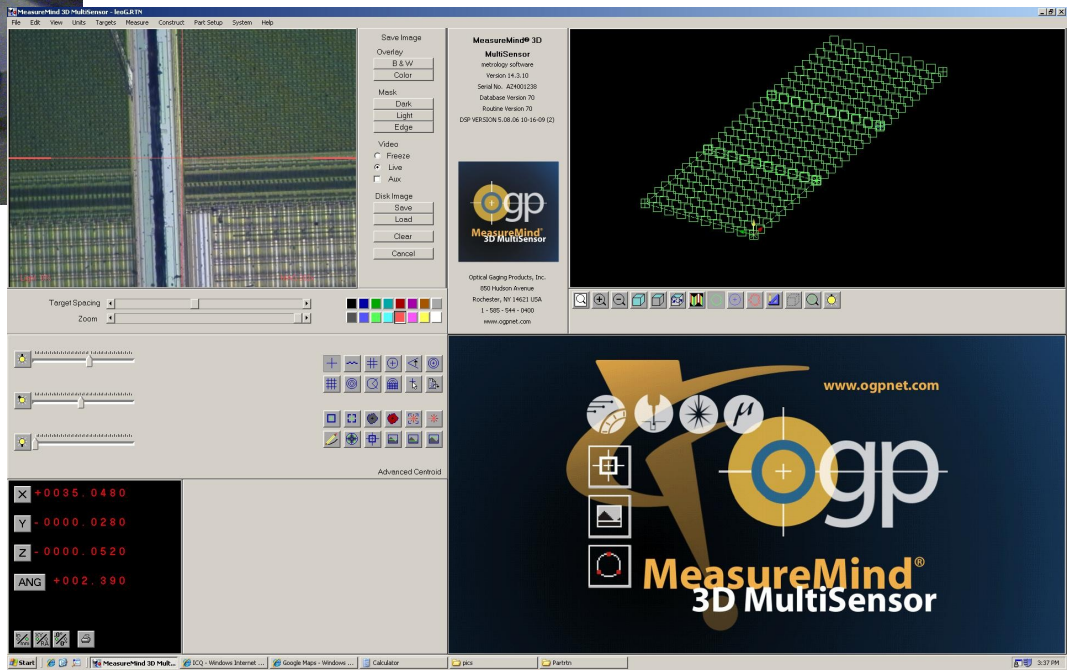
6th April

tools



OGP SmartScope
(without the touch probe)

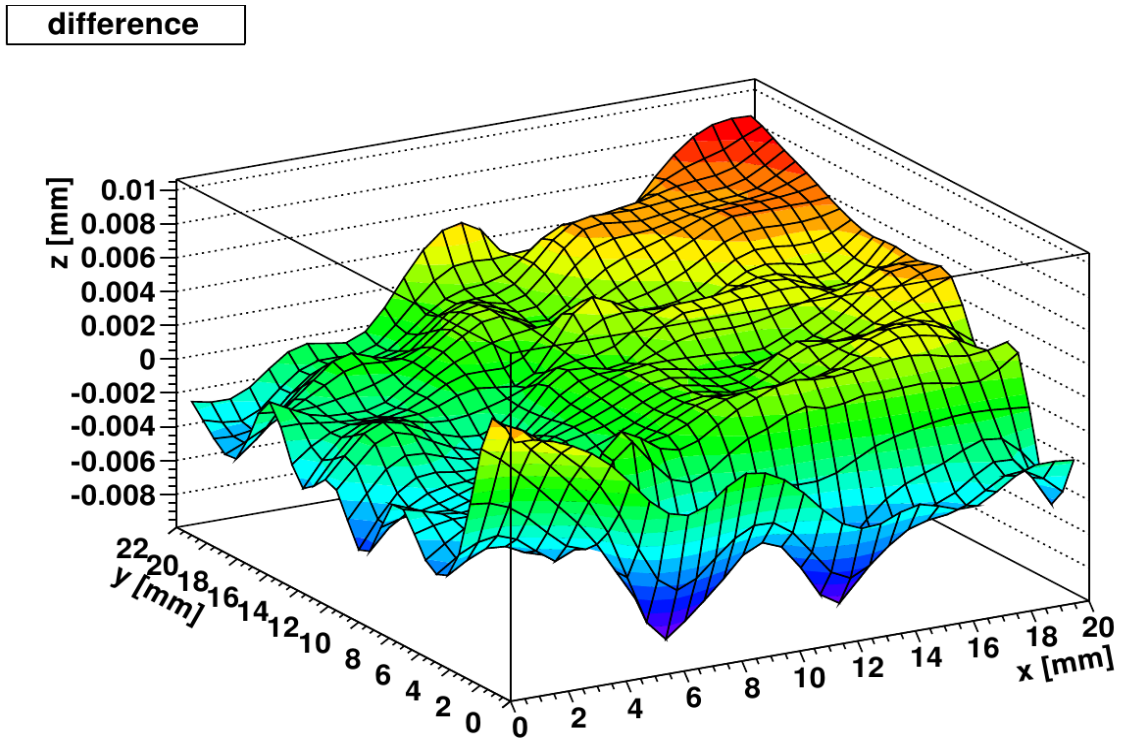


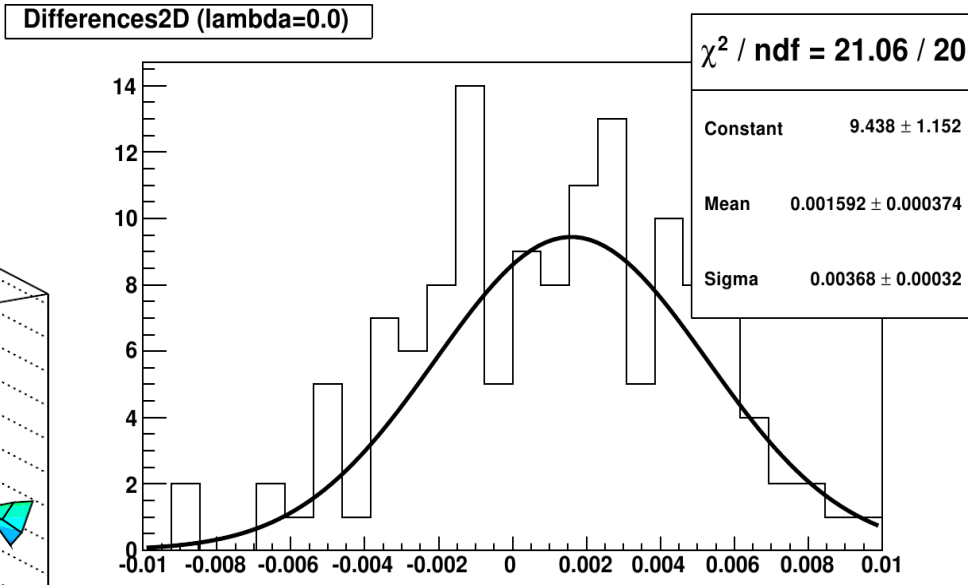
MeasureMind 3D software

1-chip measurement

- in non-changing conditions: σ of one point measurement < 1μm
- data reproducibility with different measurements:

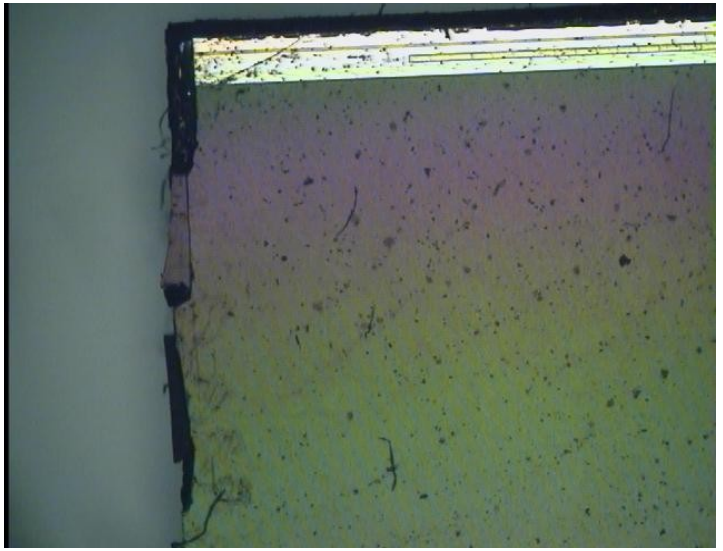
  σ < 5μm

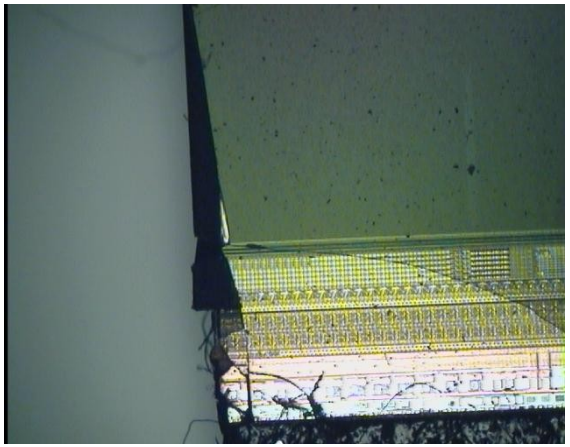


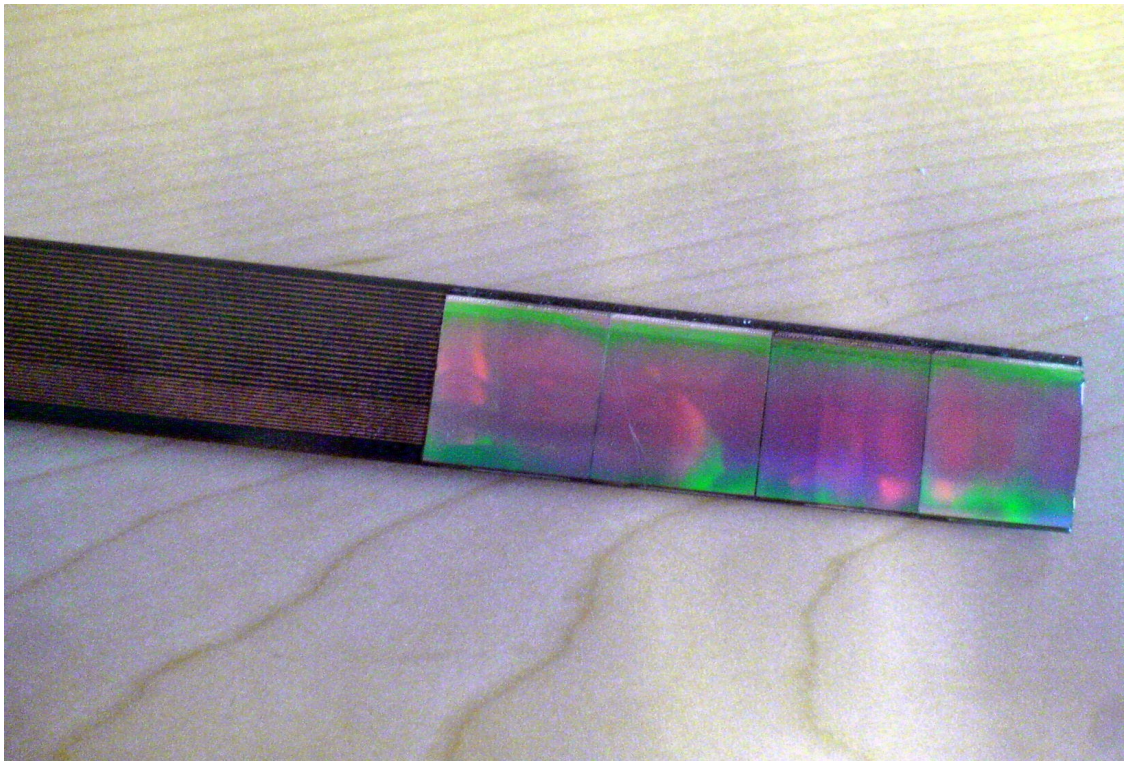


Ladder

- 4 chips on the support structure
- smaller (AA 17,3 µm x 17.4 µm)





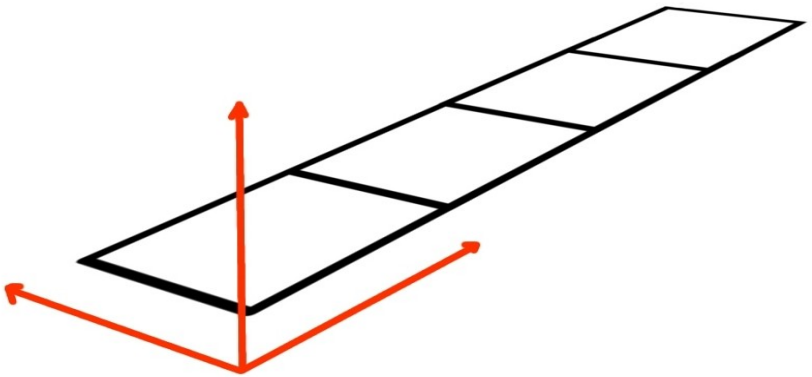


1st sensor is broken

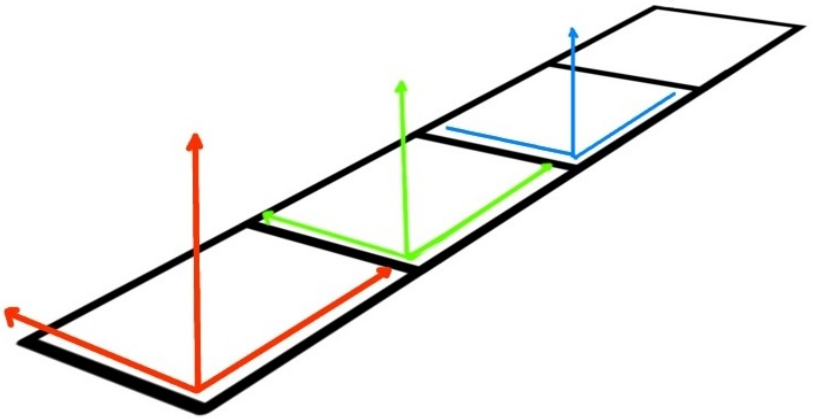
measurement set-up

- how to set-up coordinate system:

1 global CS



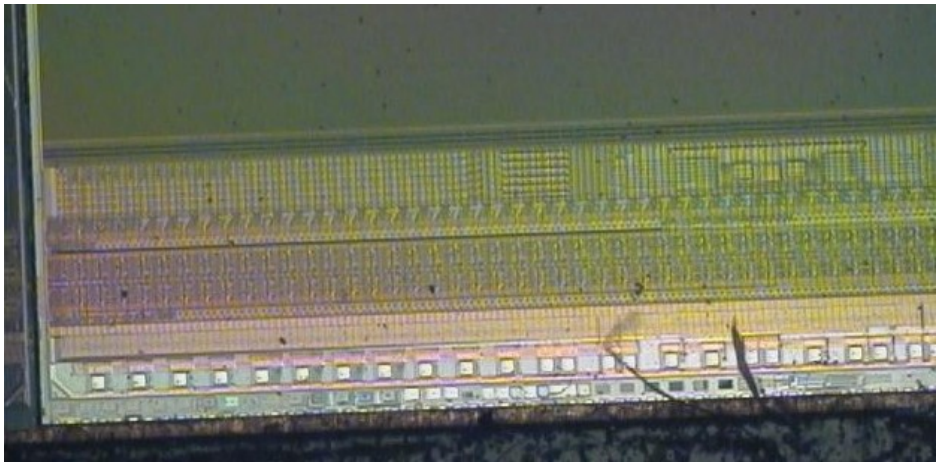
more local CSs

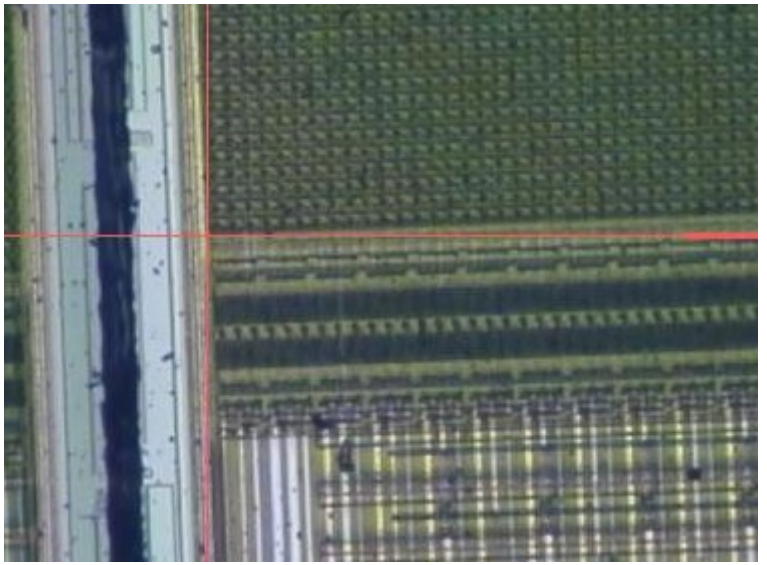


- second way is more convenient for our purpose

measurement set-up

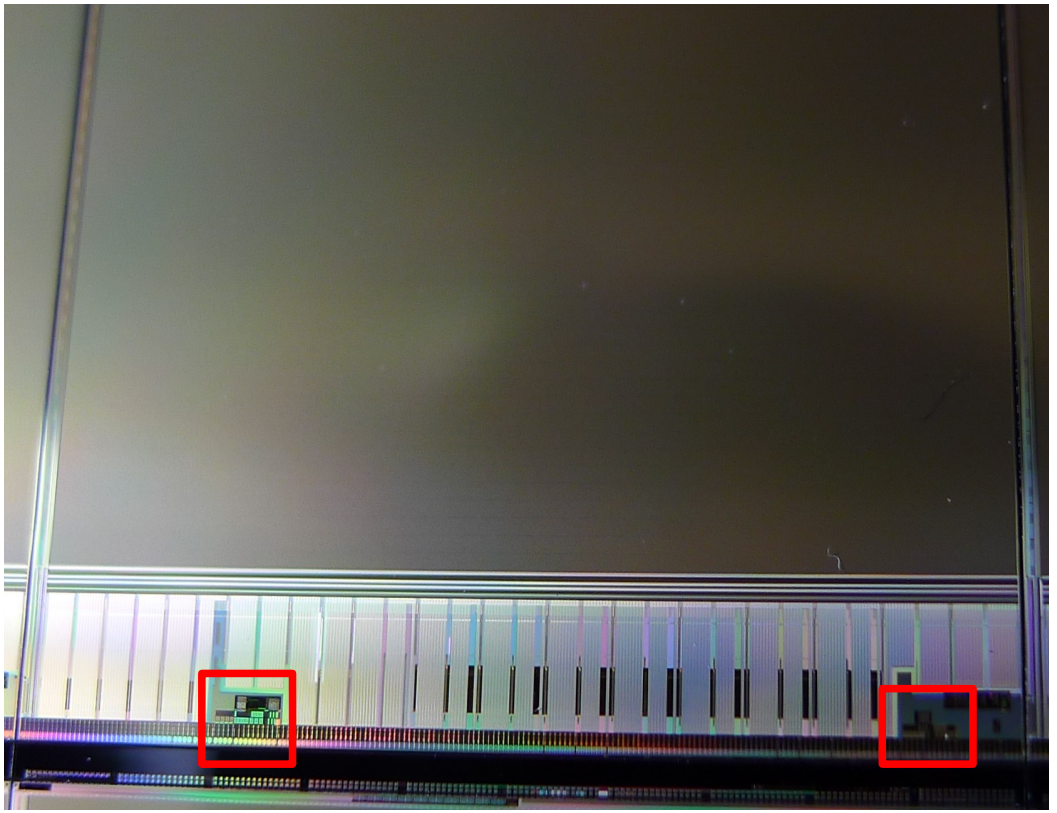
- crucial step is to define measurement datums
- there are no nice features on these chips -> active area corners used as datums
- significant source of systematic errors

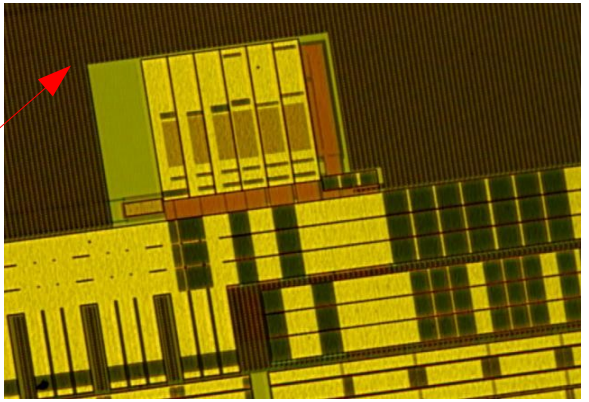


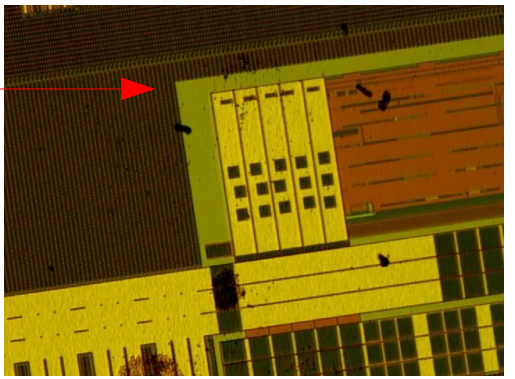


final chip features

- two corners on the ROE side



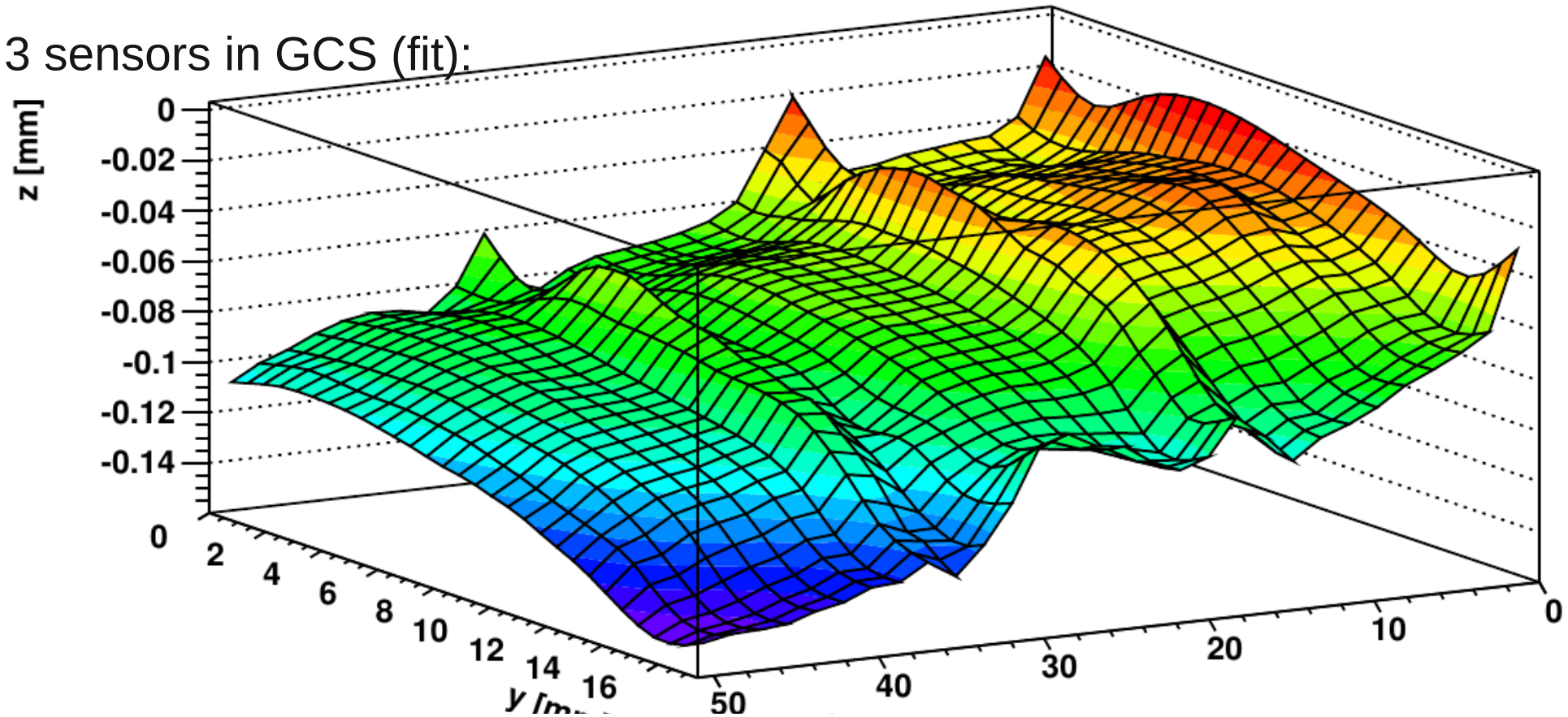




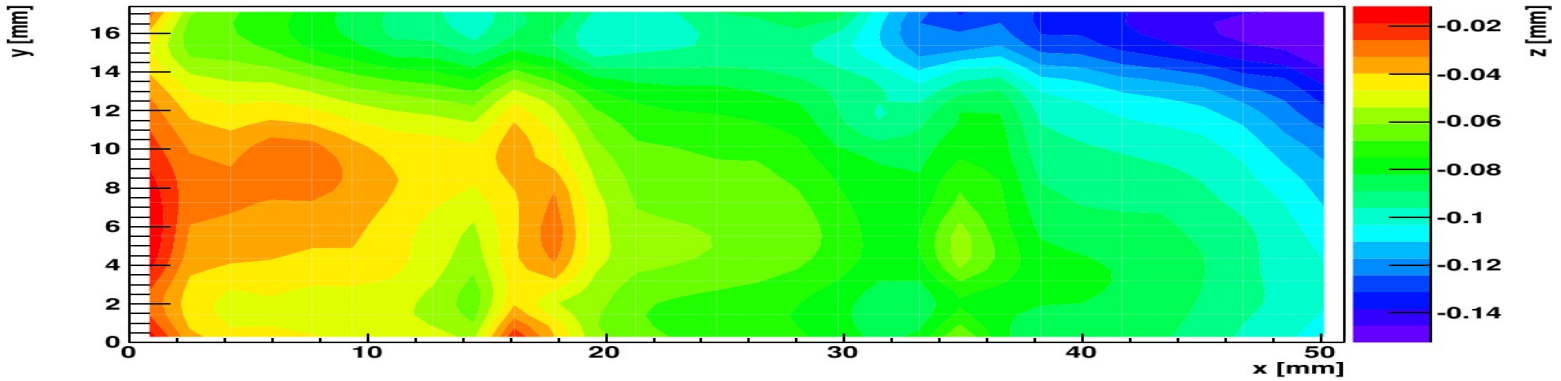
- 3rd feature?

Ladder measurement

3 sensors in GCS (fit):

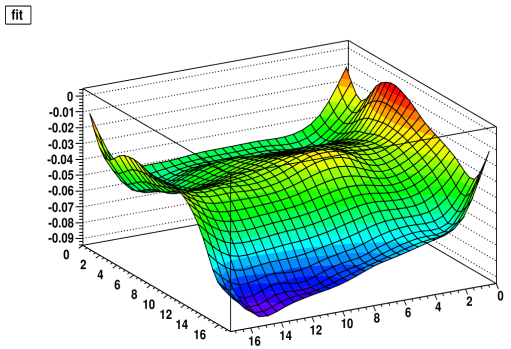


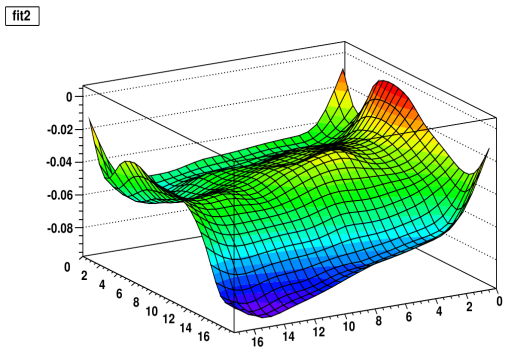
fit



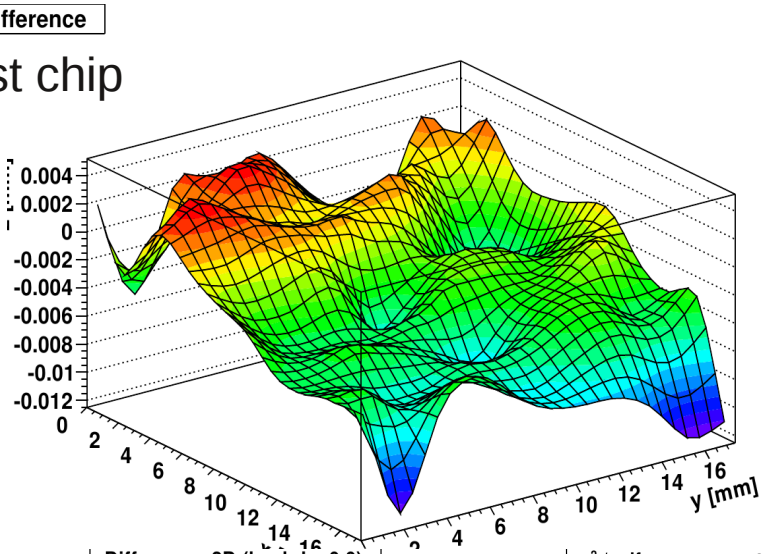
Ladder measurement

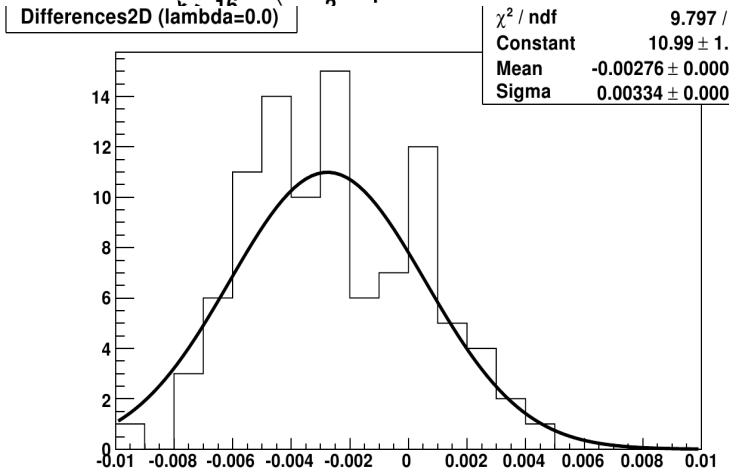
Global CS vs. Local CS:



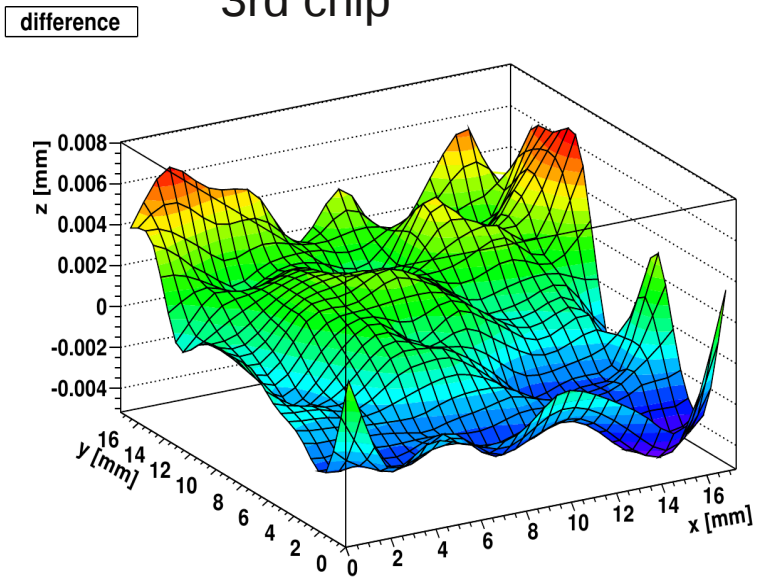


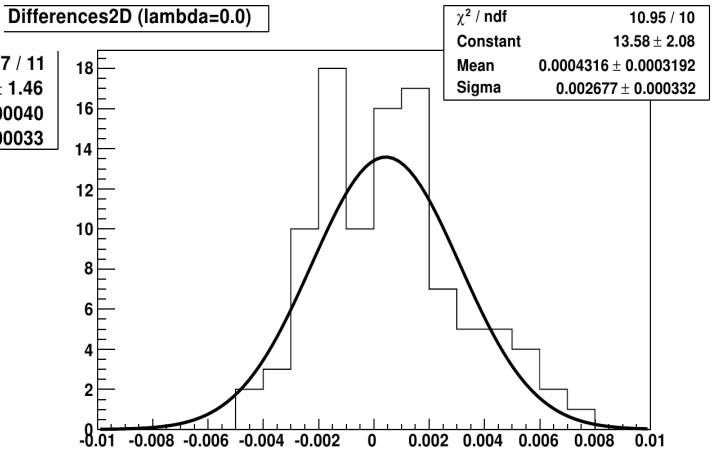
1st chip





3rd chip

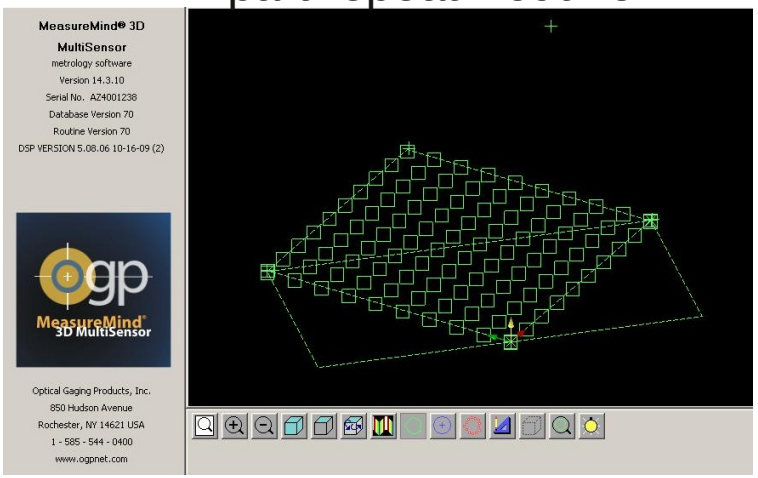




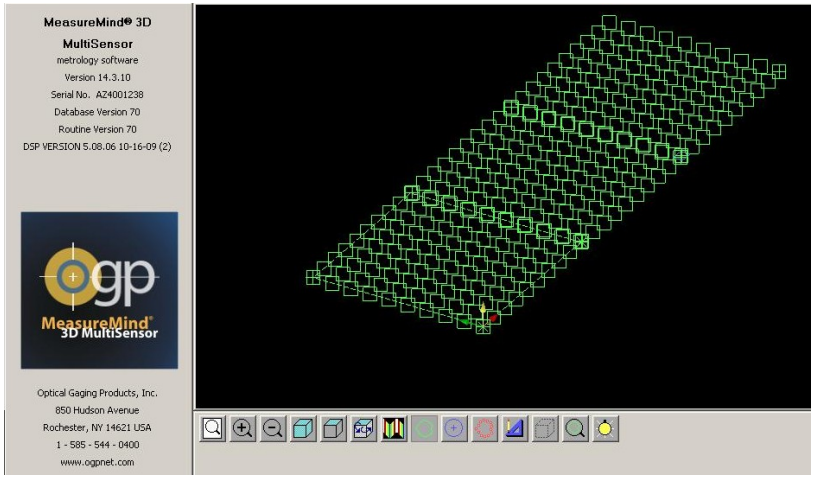
routines in MeasureMind 3D

- user-made steps are saved and then automatically repeated
- saved as a binary file – no hand-editing possible
- some steps may be copied (x,y,z offset)
- “part repeat” option can be used (=>local CS needed)
- however “edge measurement” cannot be copied/repeated since it preserves z value from the original measurement

“part repeat” routine



no repeat (imagine the 10-chips ladder...)



Conclusion

- Ladder measurement can be done fast, once the routine is created
- Precise measurement of part datums is crucial
- MeasureMind routines cannot be easily edited

  (=> measuring conditions as stable as possible)

BACKUP

lambda parameter

- controls how much the fit can deviate from the measured values used for the fit
- setting λ>0 does not improve the results