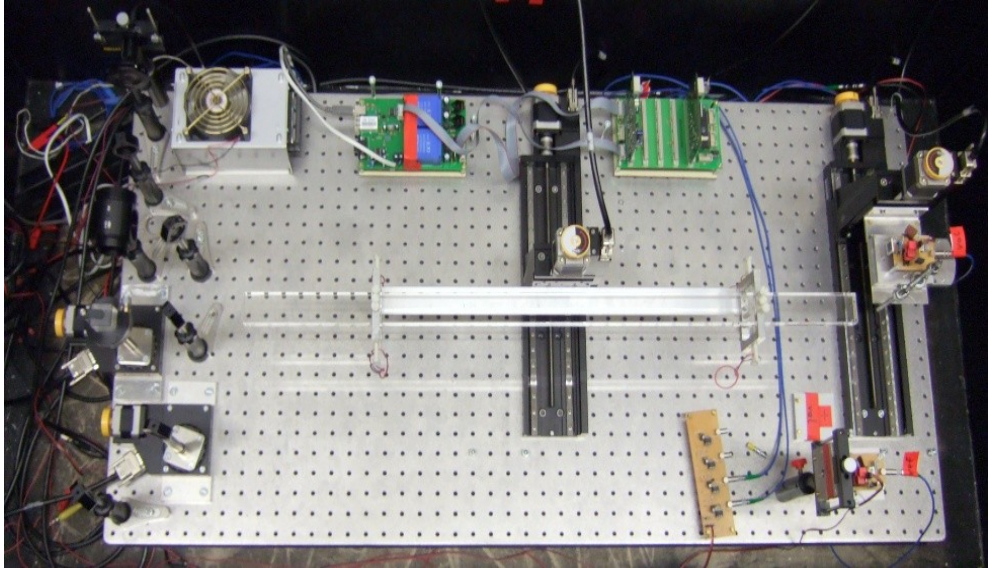
Recent activities at GSI

- Radiator characterization
  - Larger setup
  - Surface molten bars
- Read out
- Simulation

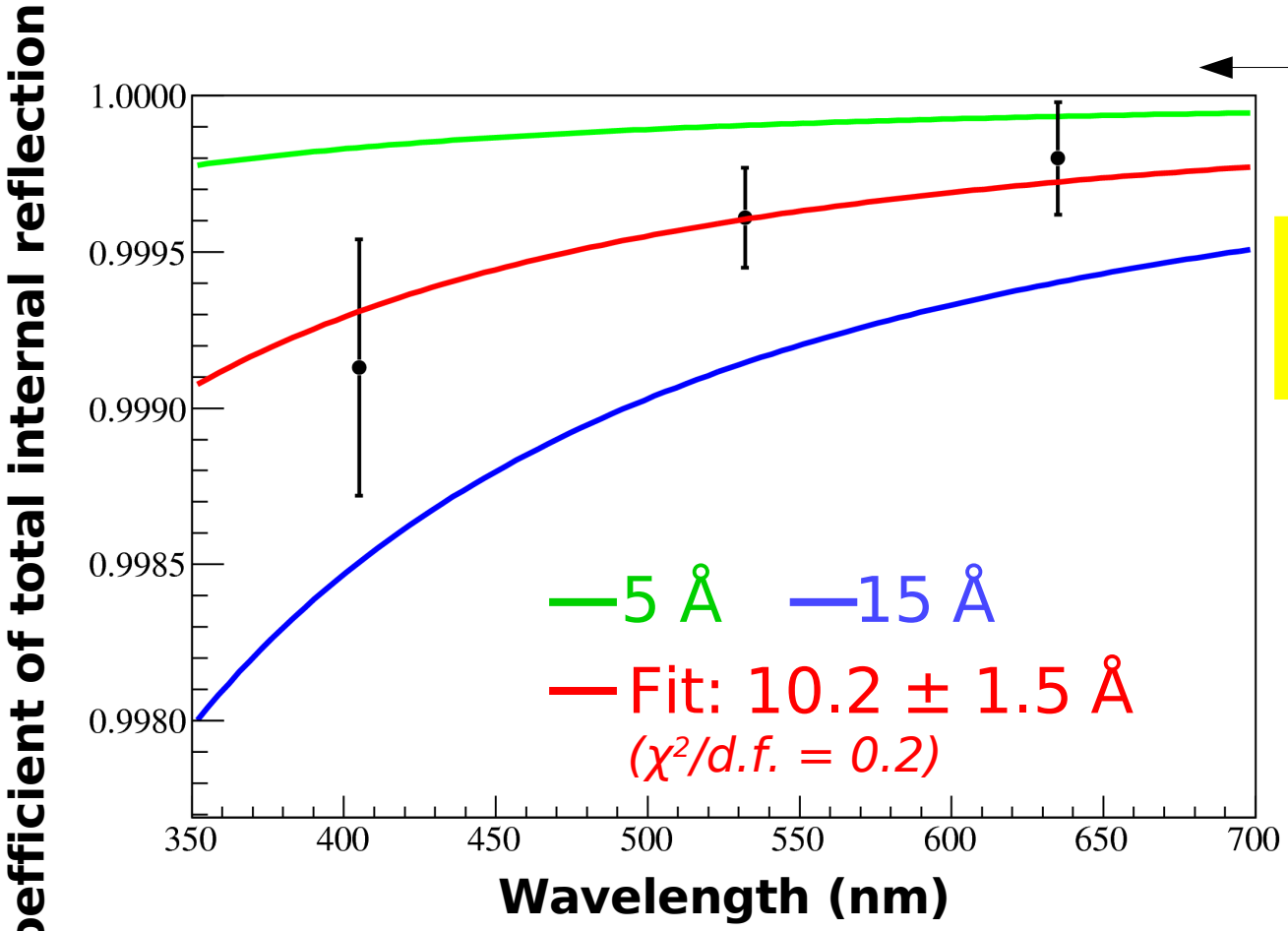
Radiator research

Larger Setup

$$P_{loss} = \left(\frac{4\pi \Delta n \cos(\theta)}{\lambda} \right)$$



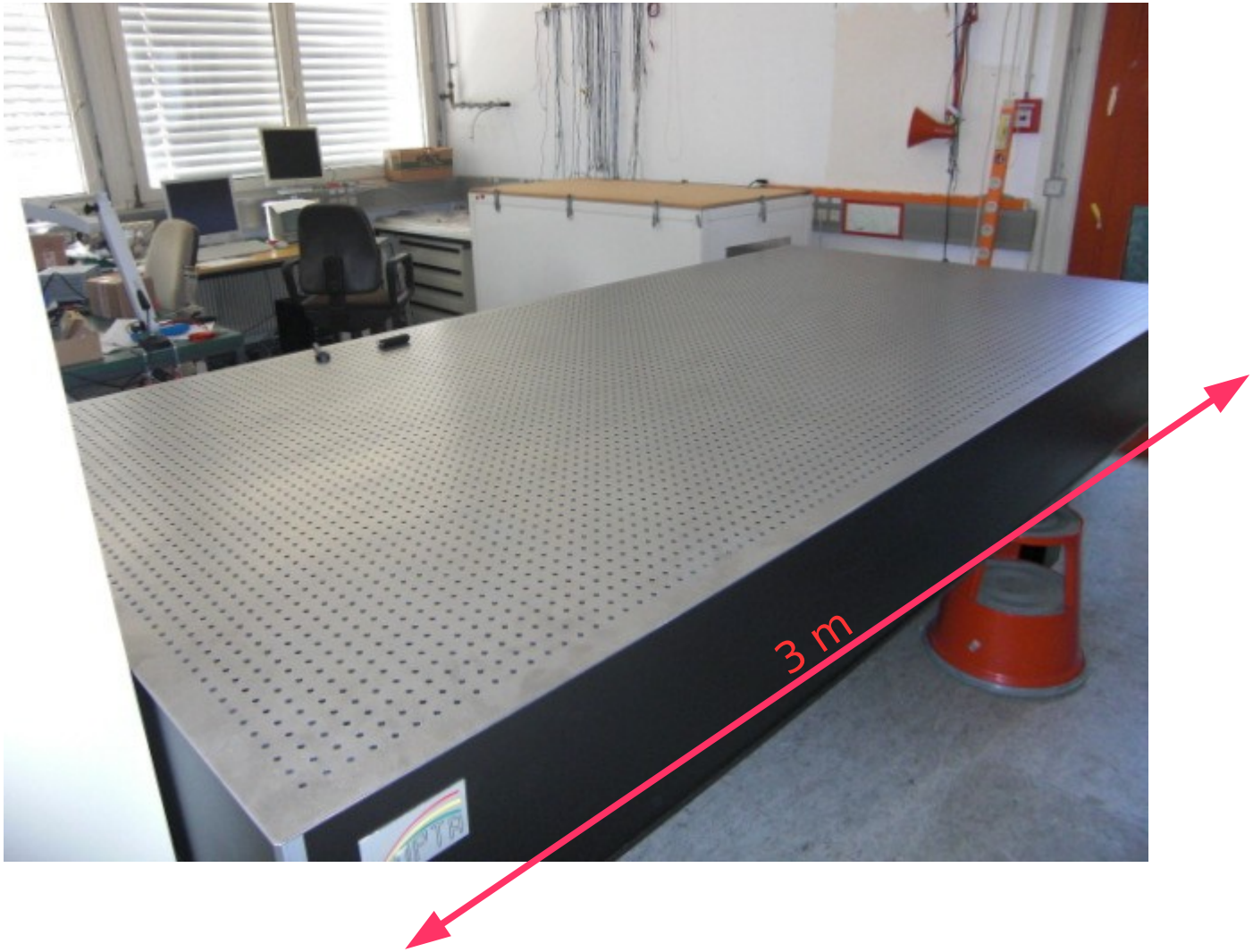
1.2m



Present/old setup appropriate for measurements of radiator bars with L ~ 80cm

Radiator research

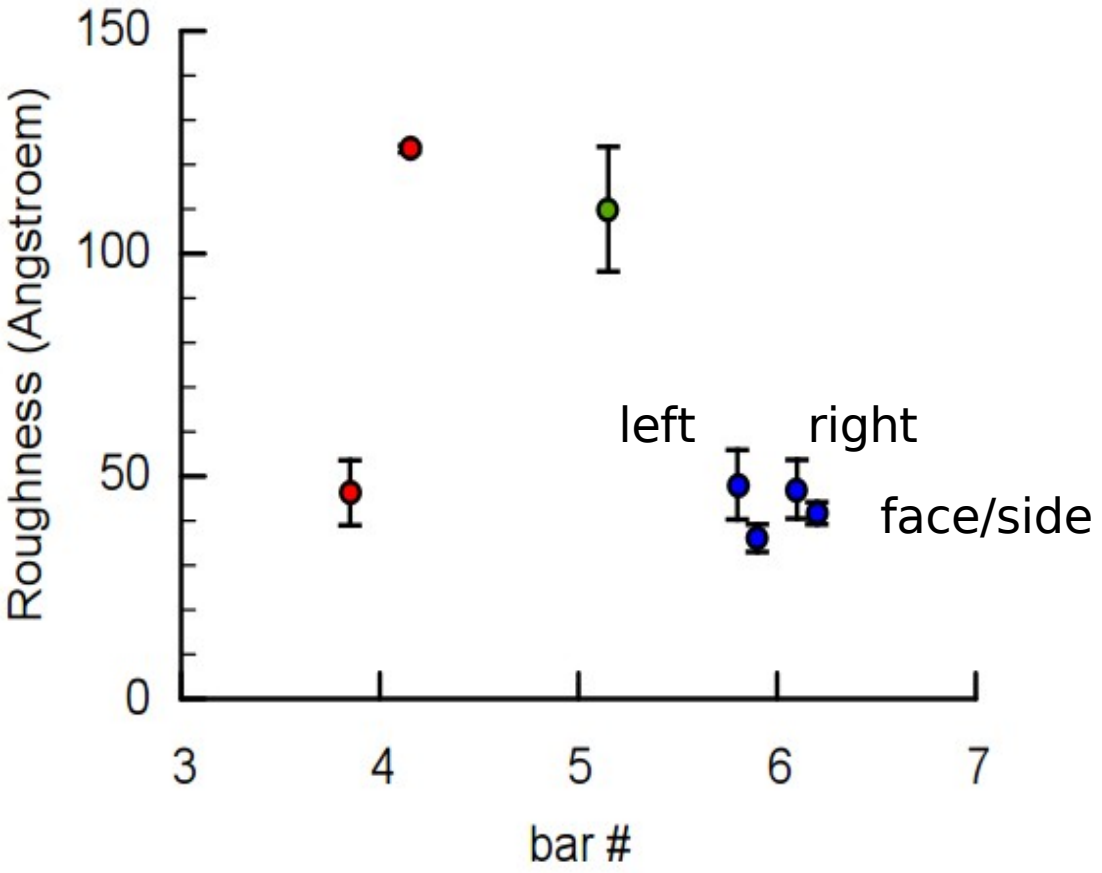
Larger Setup



Larger setup allows to measure bars of length L~2.50 m
next: construction of a dark room

Radiator research

Surface molten bars



Heraeus bars #4,5, and 6 ground to rectangular shape surface molten with different parameters

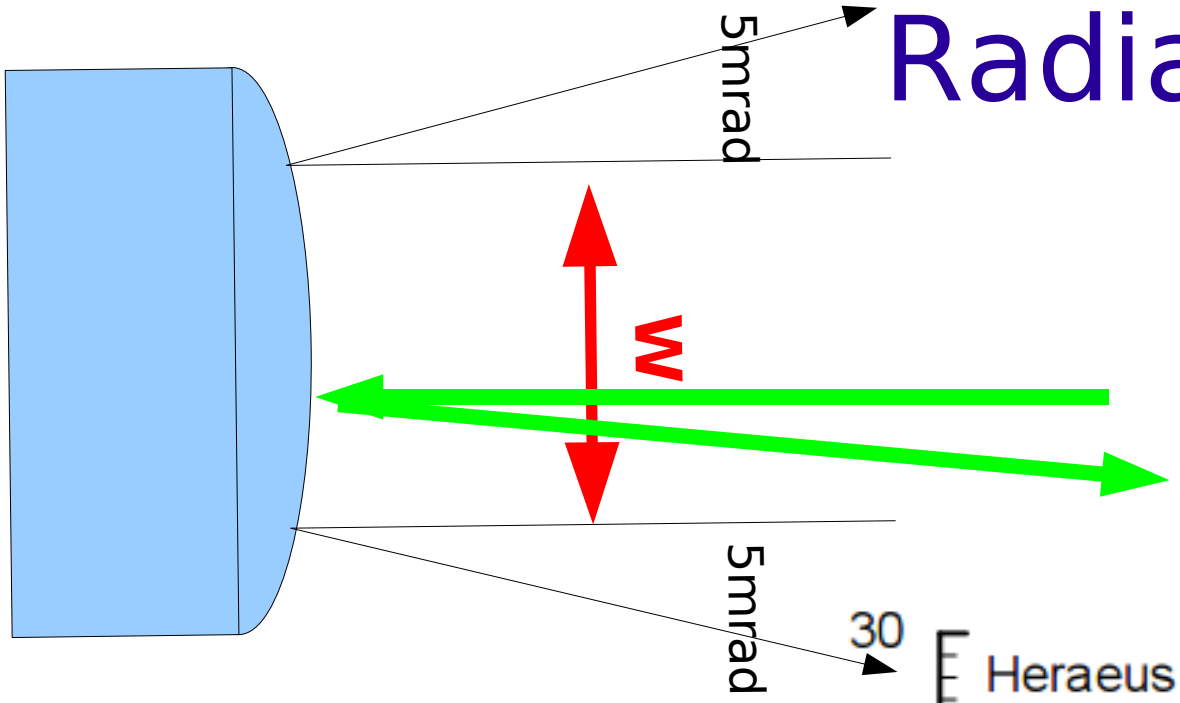
- Temperature
- Speed through oven

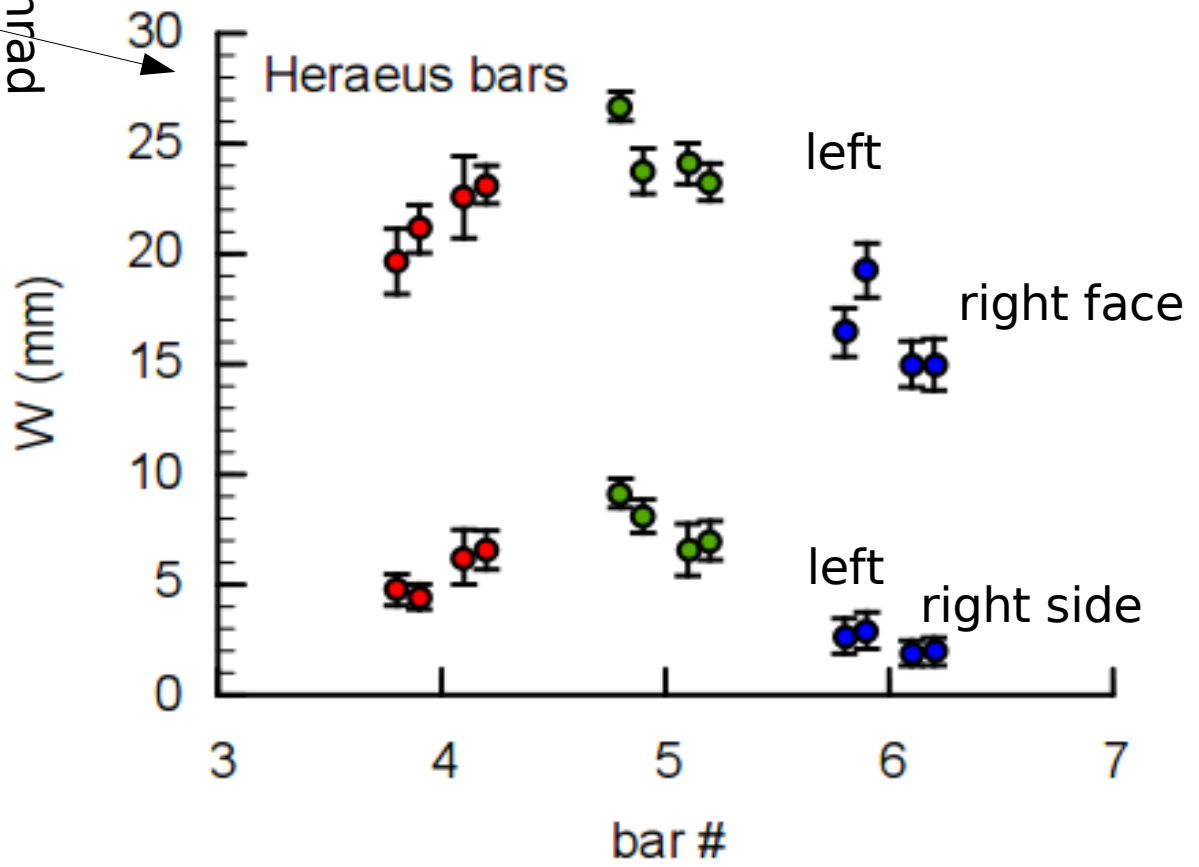
on both sides of the bar

surface smooth to 40-50 Å

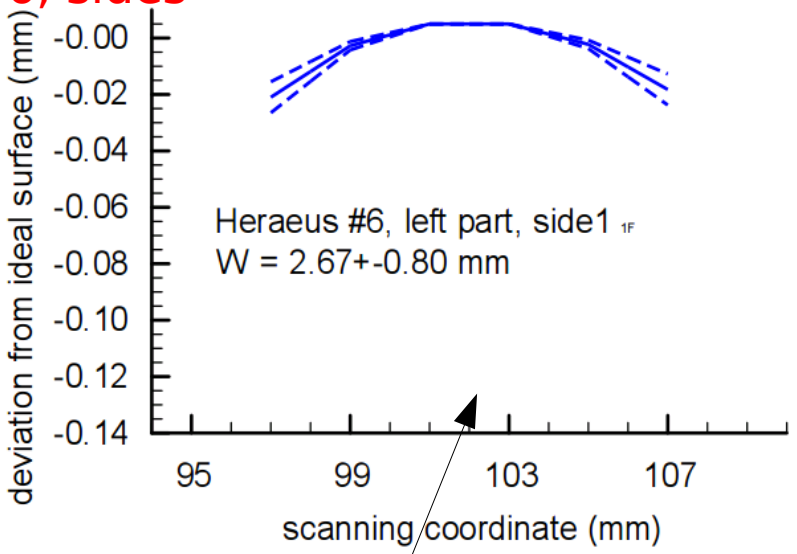
Radiator research

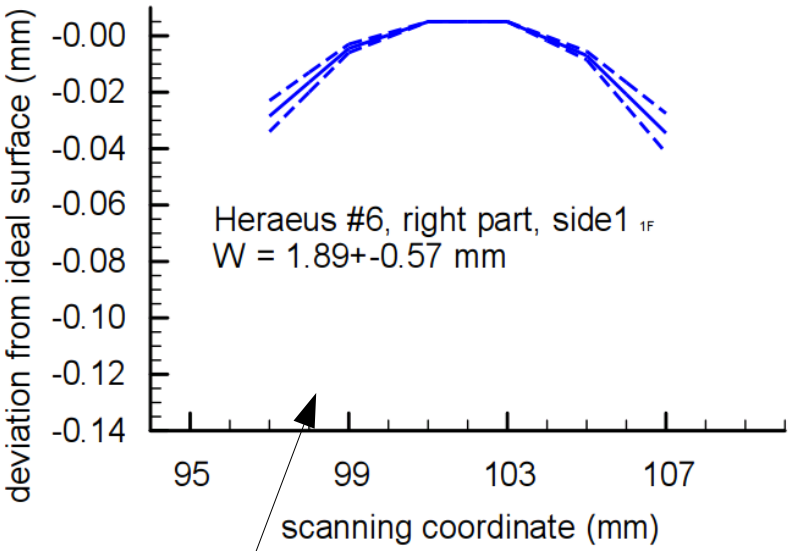
Surface molten bars

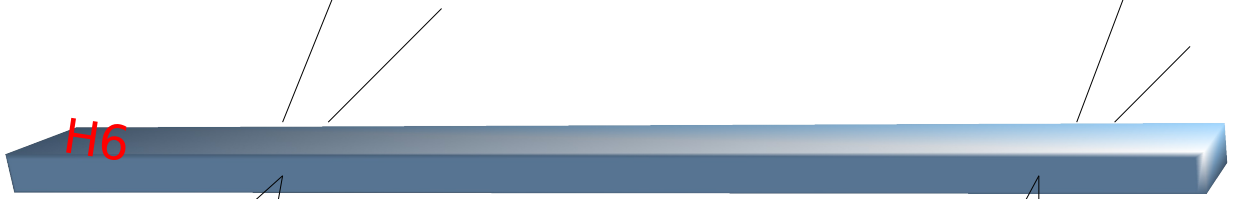


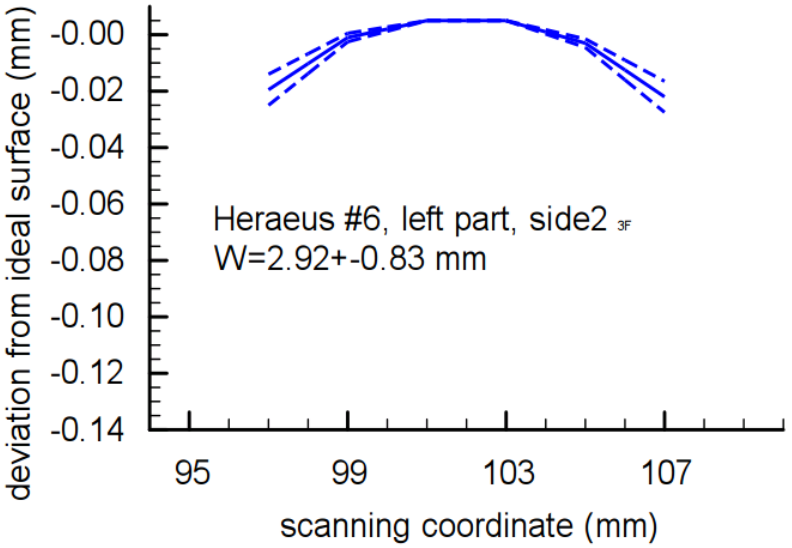


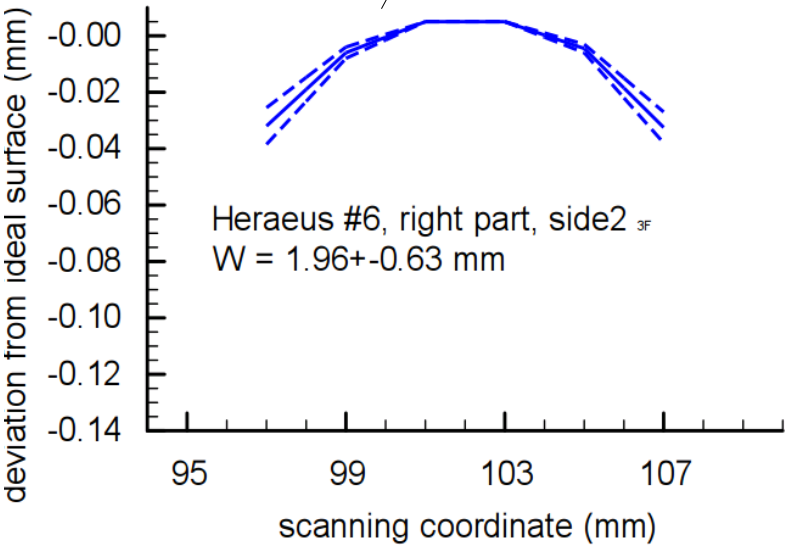
Heraeus #6, sides



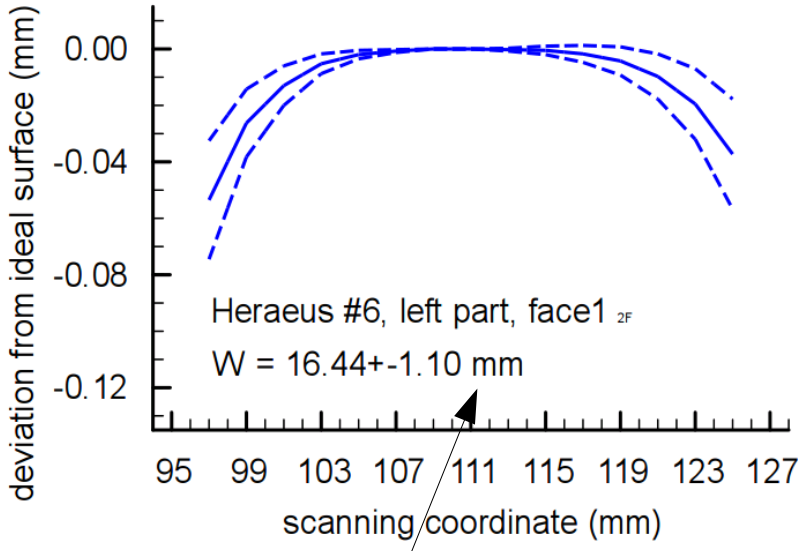


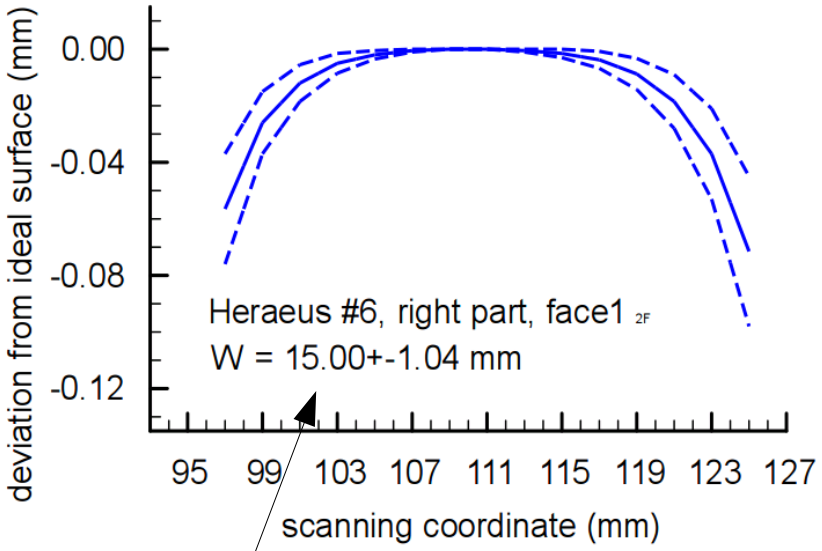


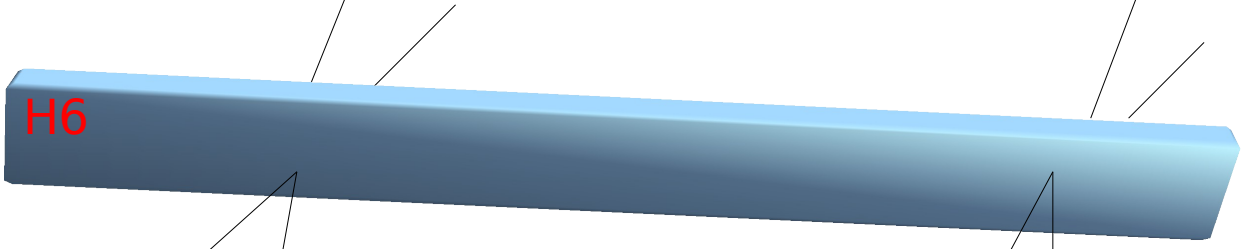


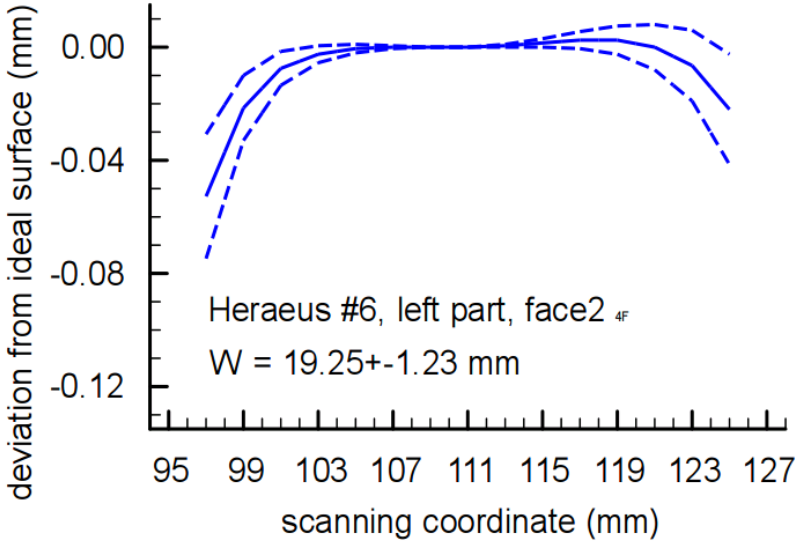


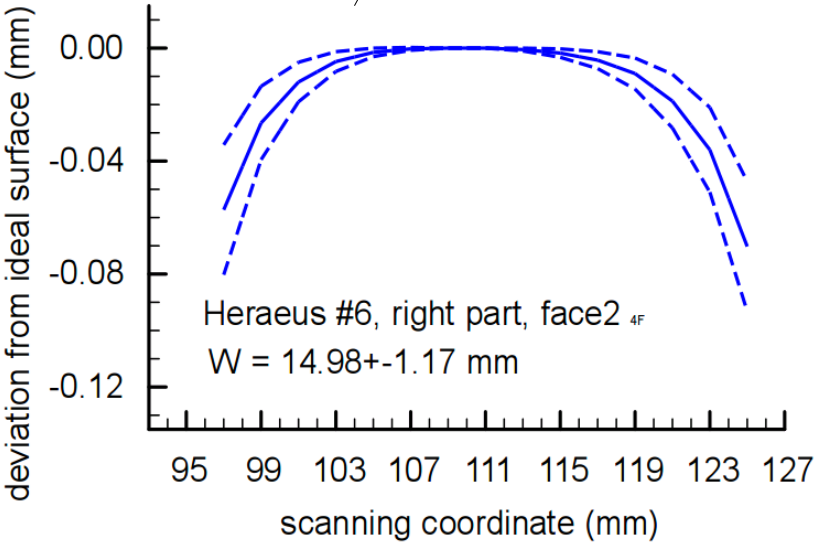
Heraeus #6, faces





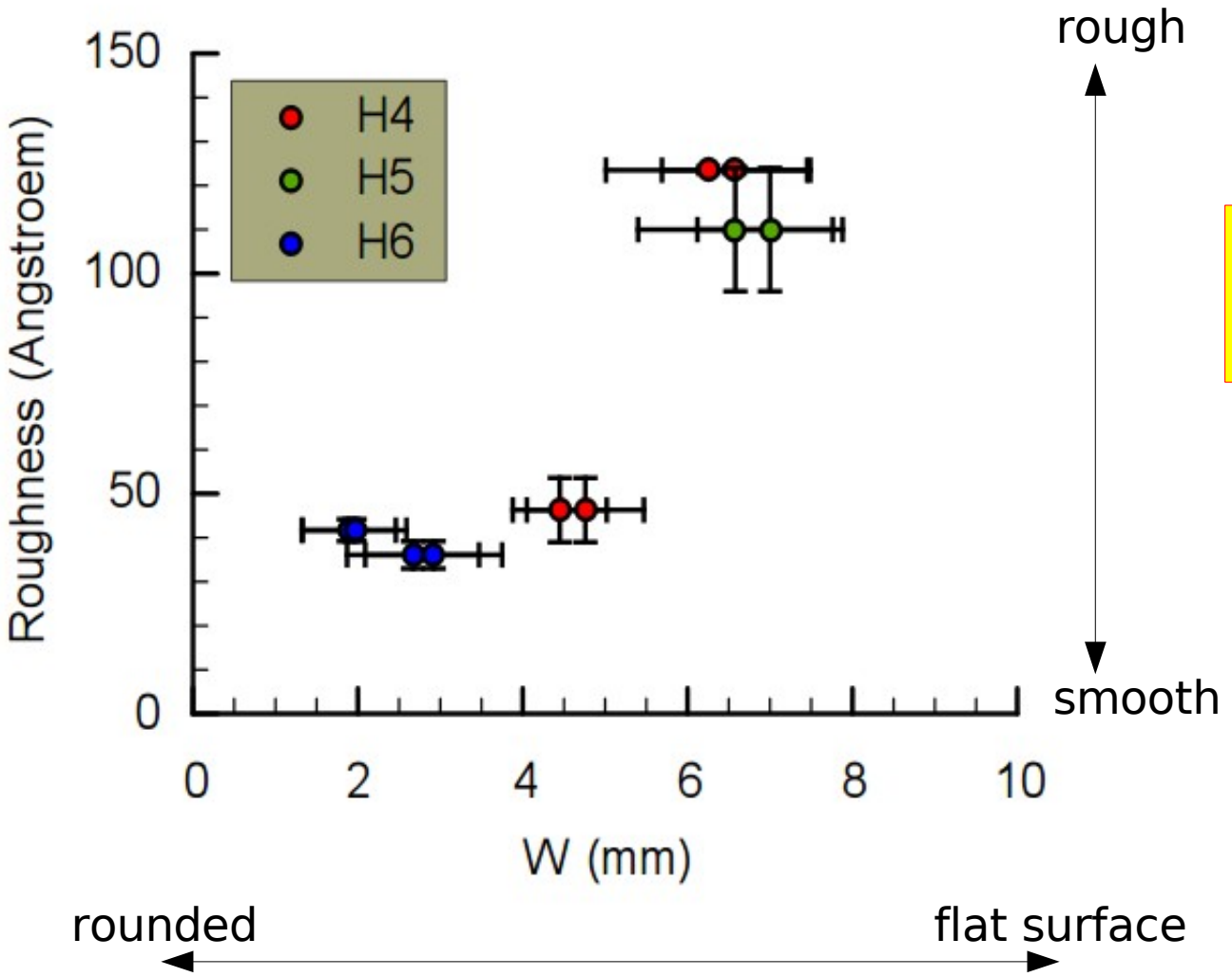






Radiator research

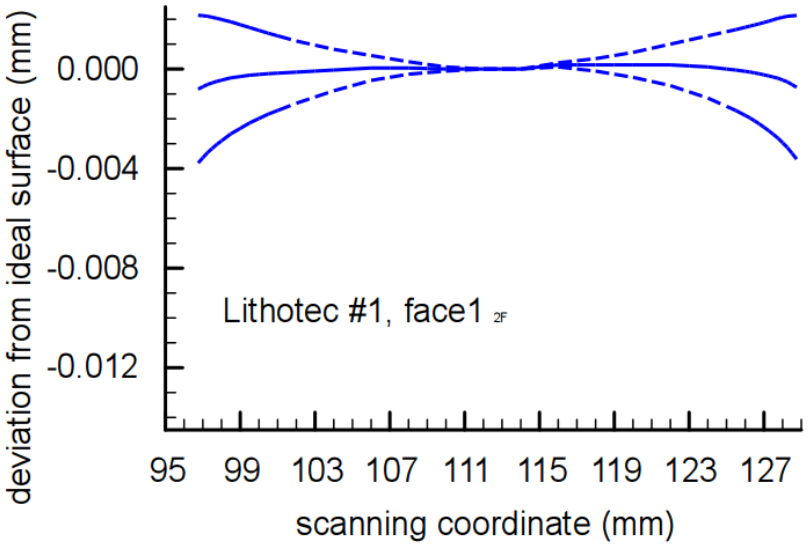
Surface molten bars



observed:
Correlation beween
roughness and shape

How a polished bar looks like?
Lithotec #1

Increased lever arm of Lasers L = 12m

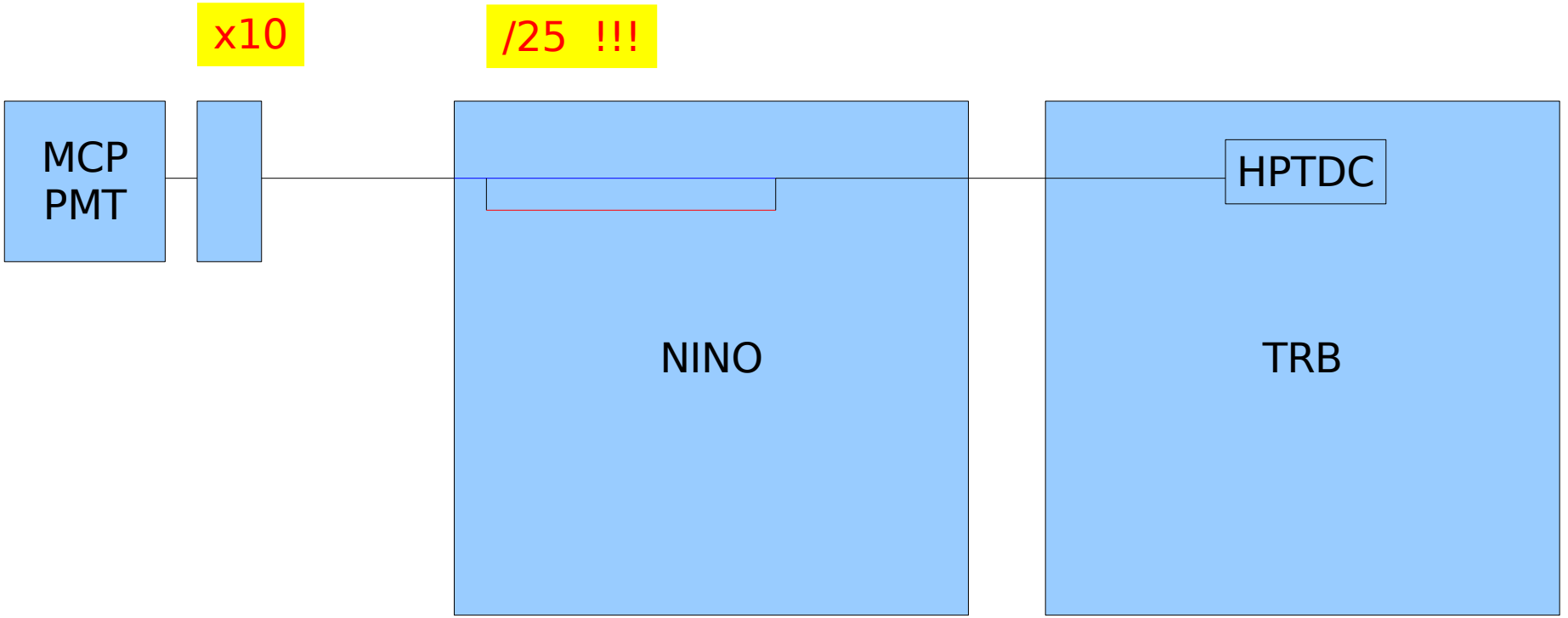


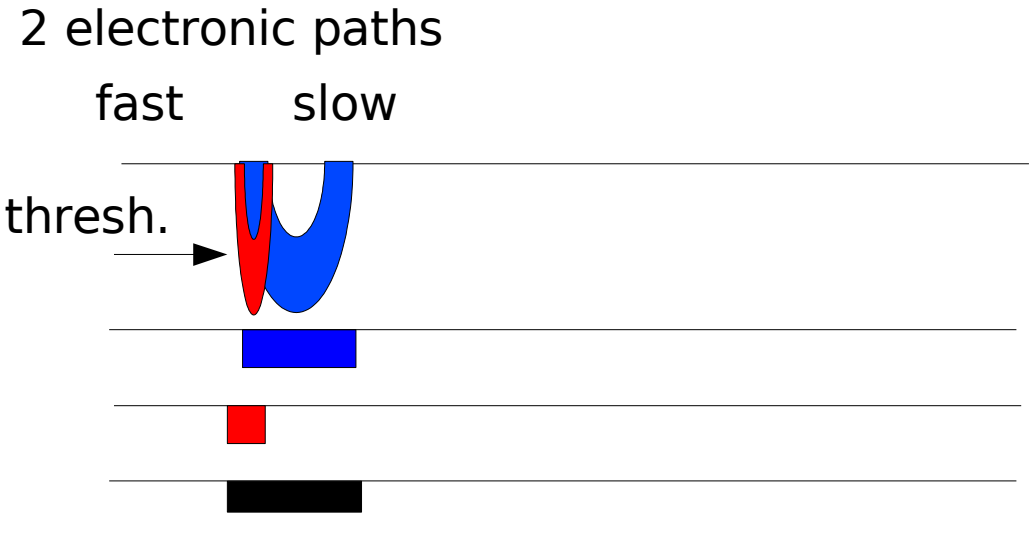
no shape distortion visible

The surface molten bars show too large edge rounding.
Not an option for barrel DIRC bars.

Plates???

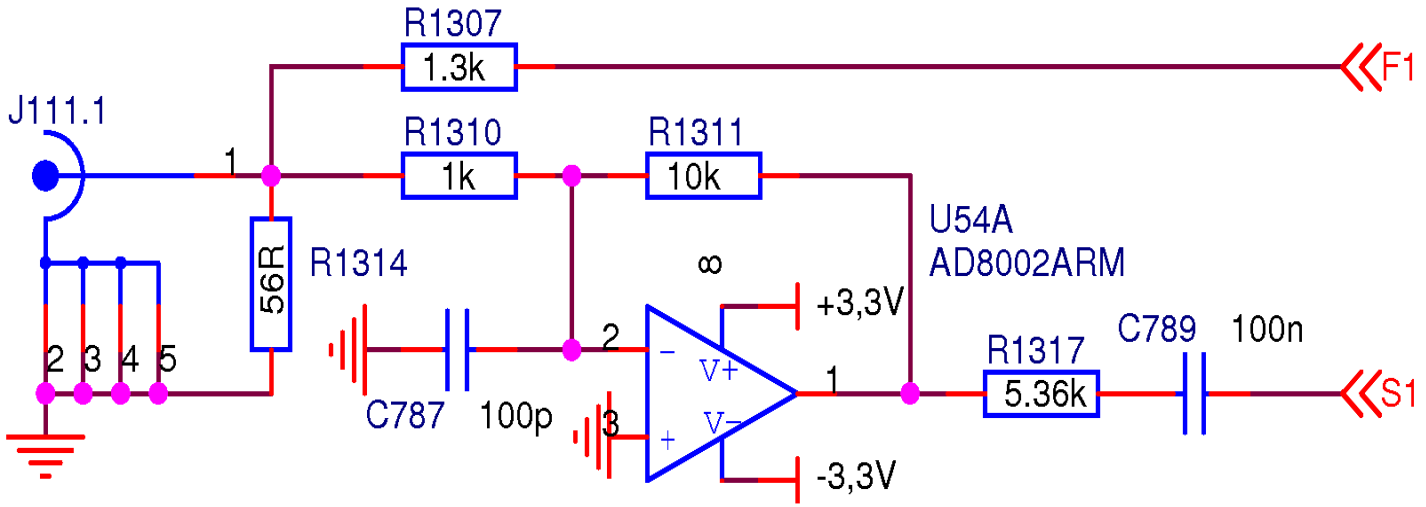
Read out

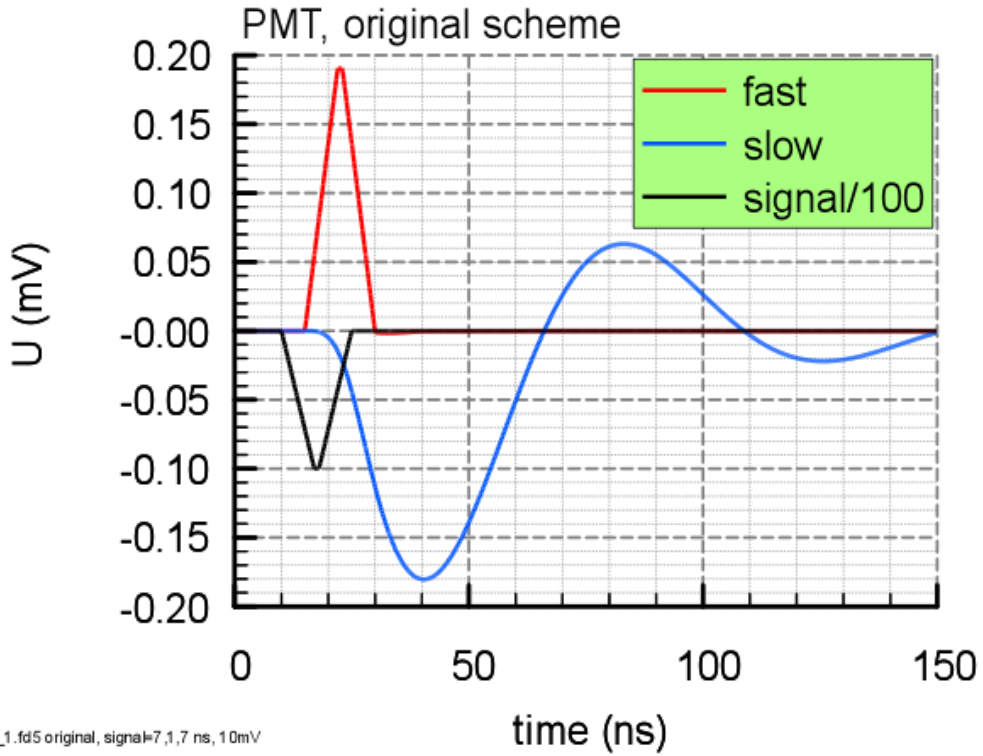

x10
/25 !!!
MCP
PMT
NINO
HPTDC
TRB


2 electronic paths
fast
slow
thresh.
TOT

Read out

Original design





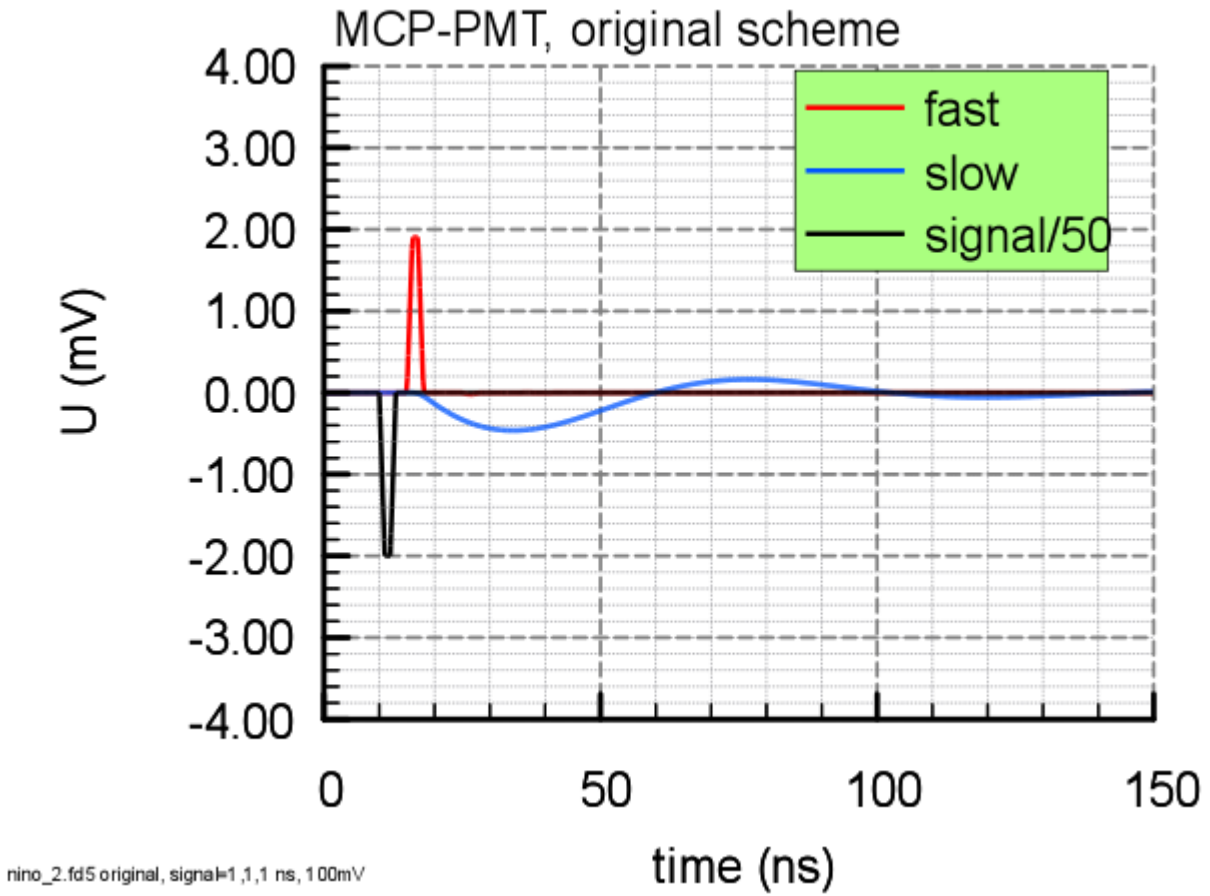
"slow" PMT signal

gEDA/ng-spice simulation:

fast and slow have same amplitudes

fast MCP-PMT signal

after preamp 100mV signal

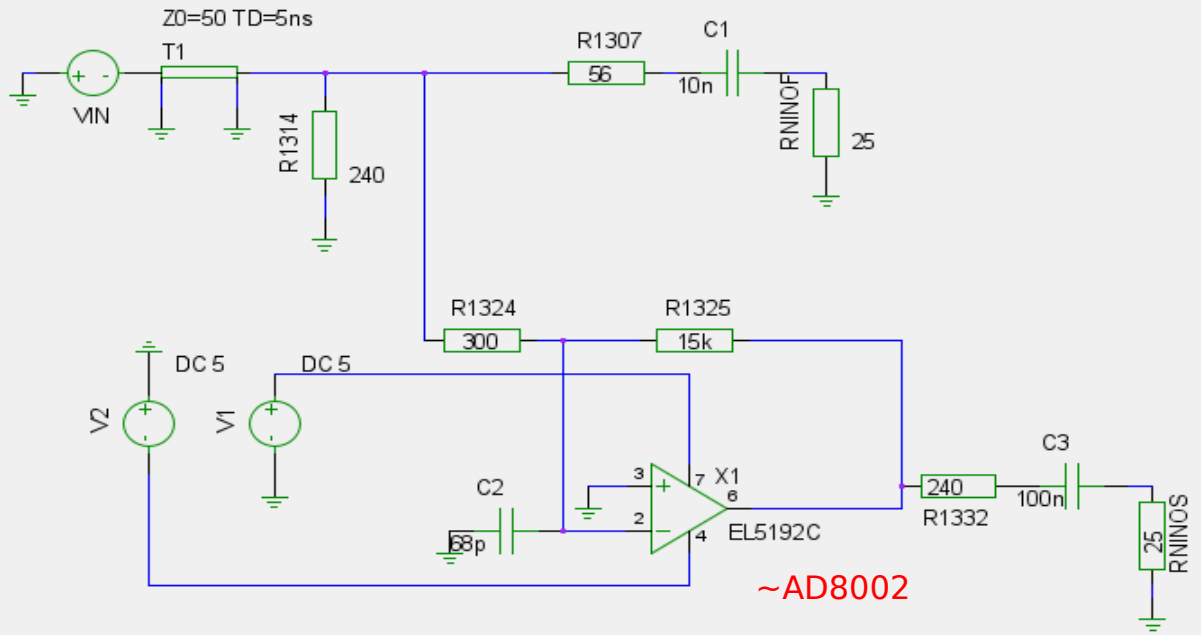


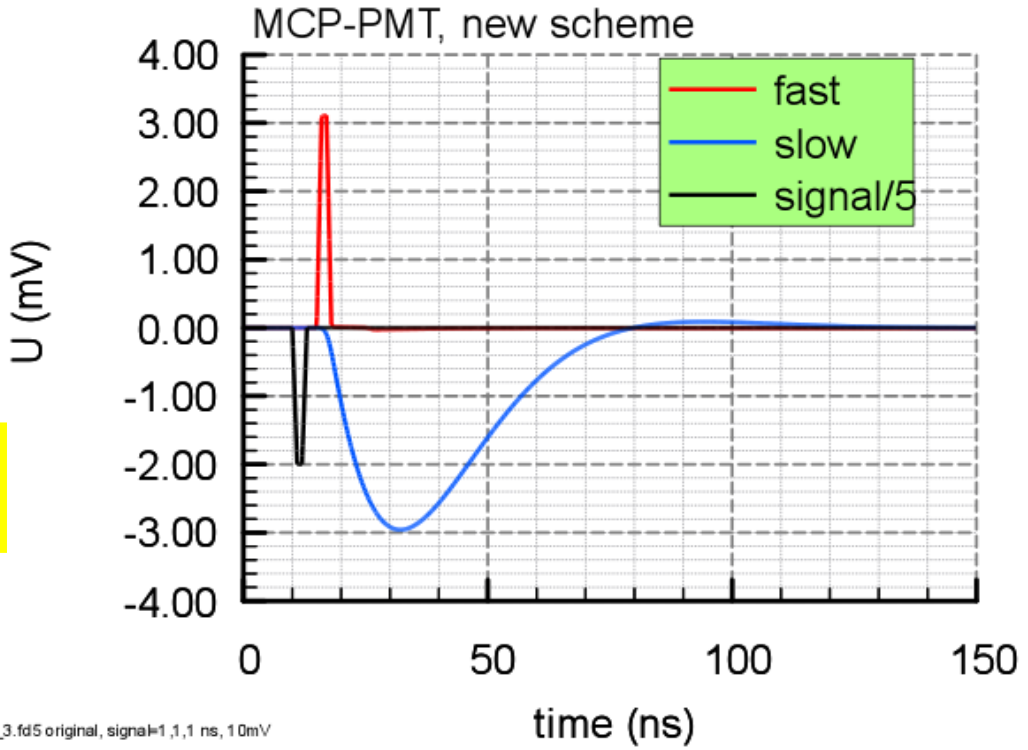
mismatch in amplitudes for fast/slow

possible problem for time over threshold

New design

Simulation





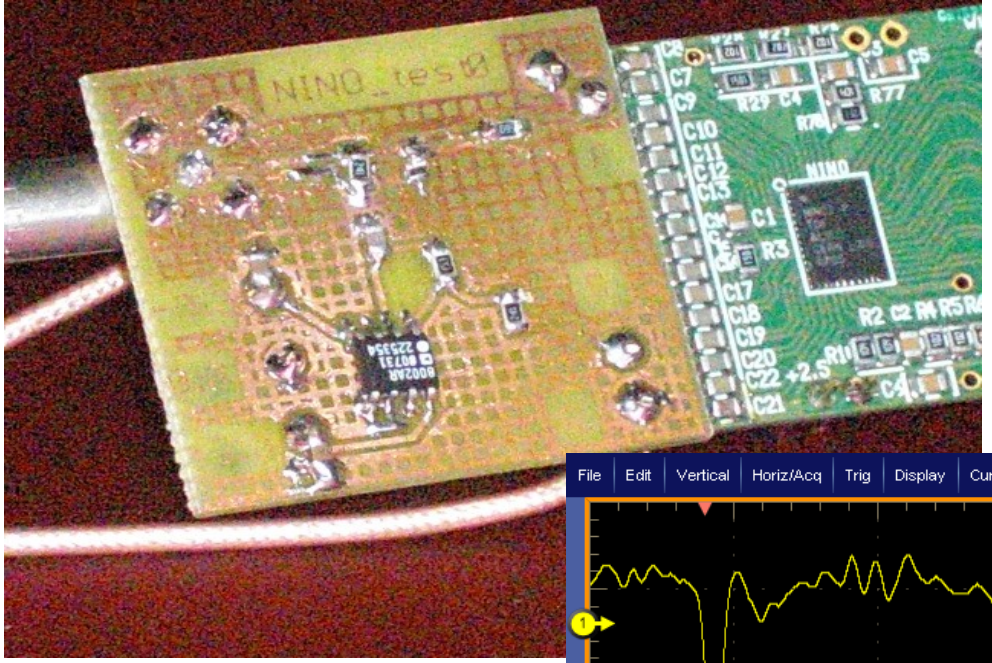
6 parts are changed

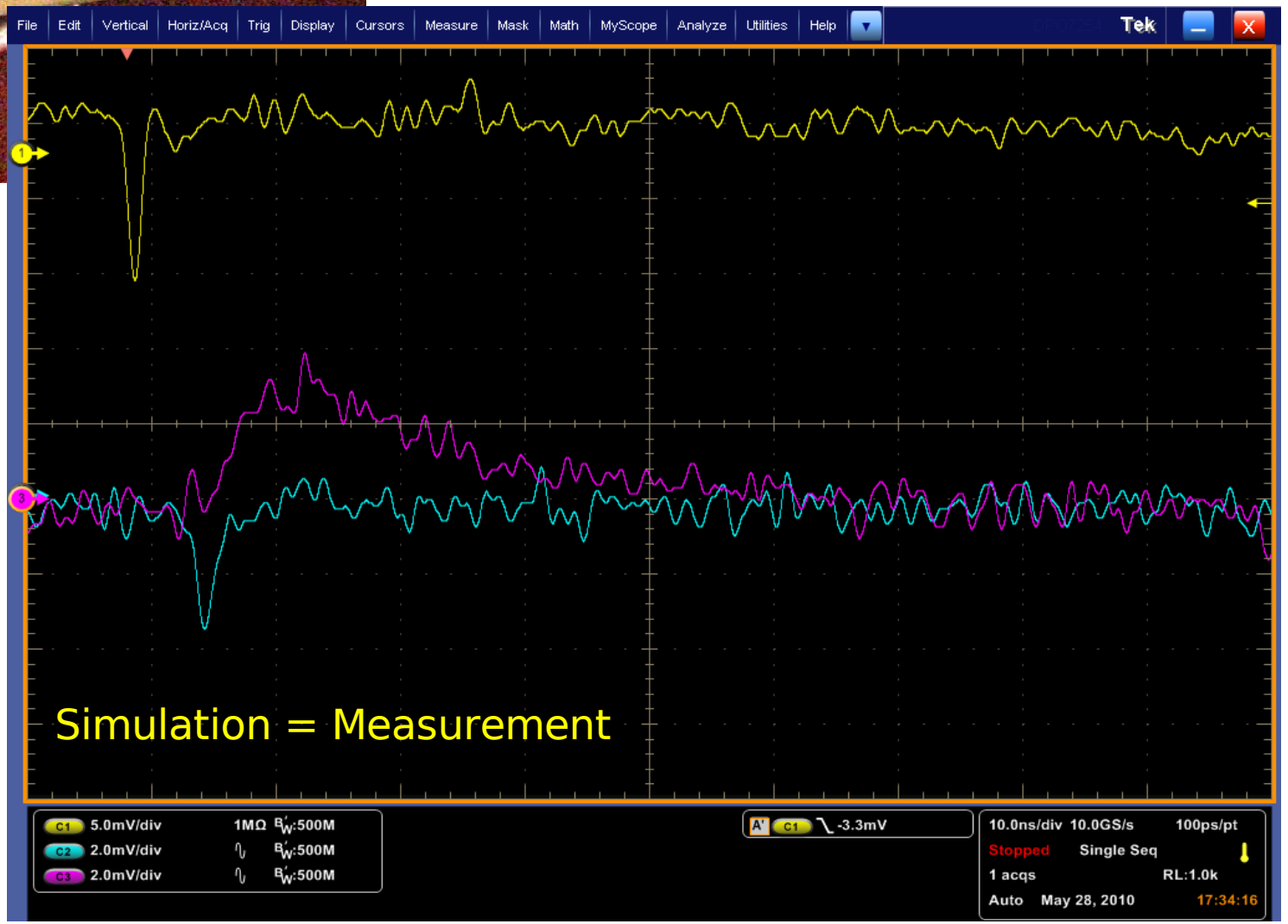
Higher gain of x16 for both channels, amplifier x10 can be skipped

Read out

New design

Test board



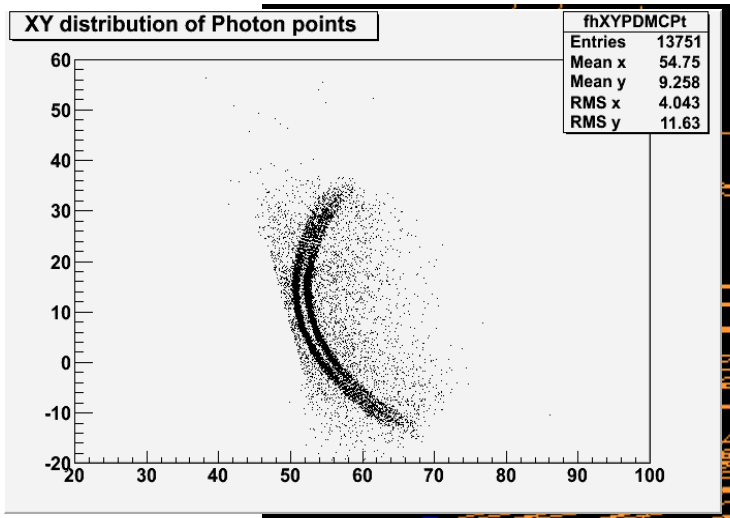


Three boards
(3 x 128#)
will be produced

Simulation

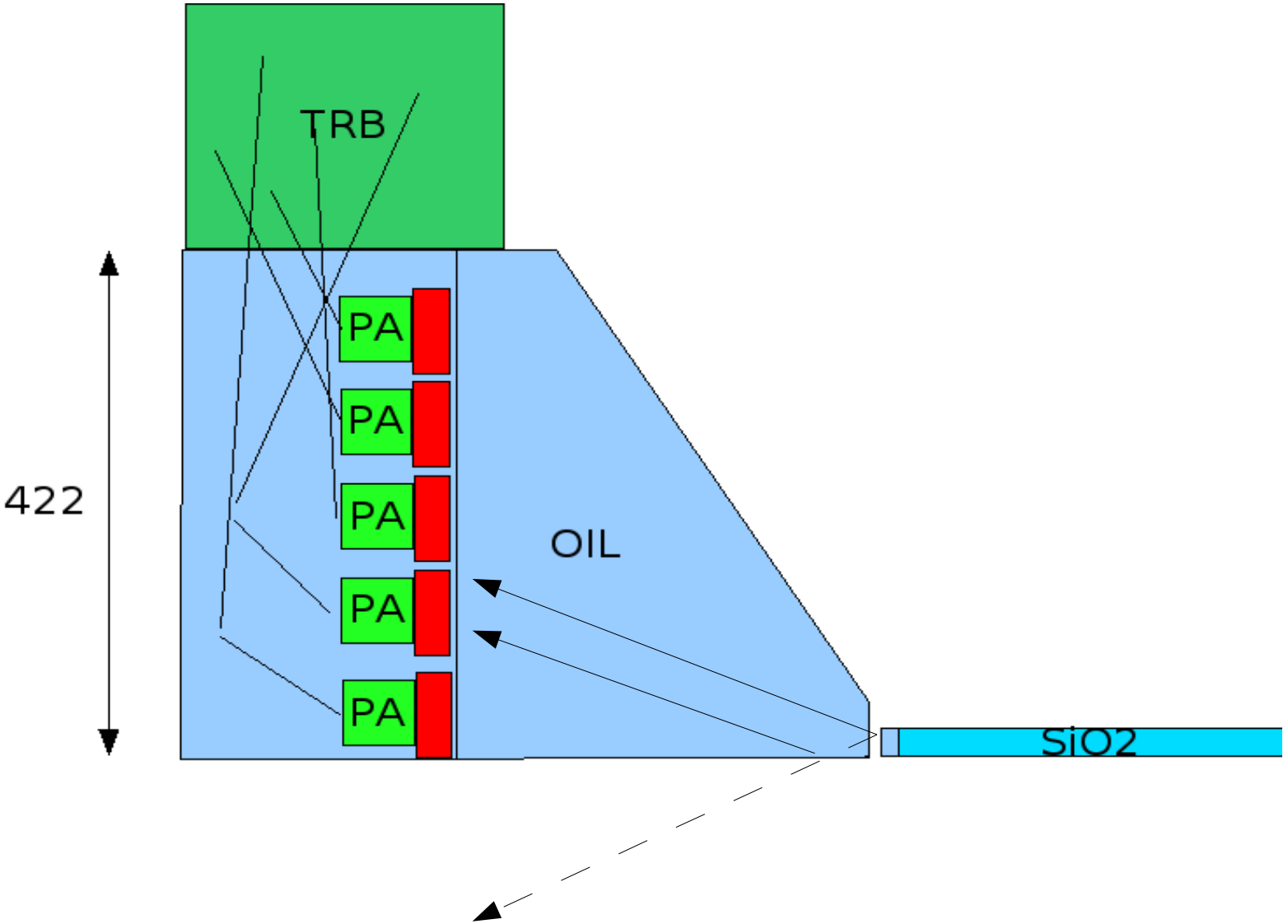
PandaRoot

DIRC double ring structure: understood



Double ring is due to reflection from photon propagation medium

D. Dutta



New ambiguity needs closer inspection...

Summary

- Radiator research
  - started new setup for long bars
  - surface molten bars show shape distortions
- Read out
  - increased gain of TOF-ADDON
  - identified possible problem for TOT
- Simulation
  - identified reason for double rings