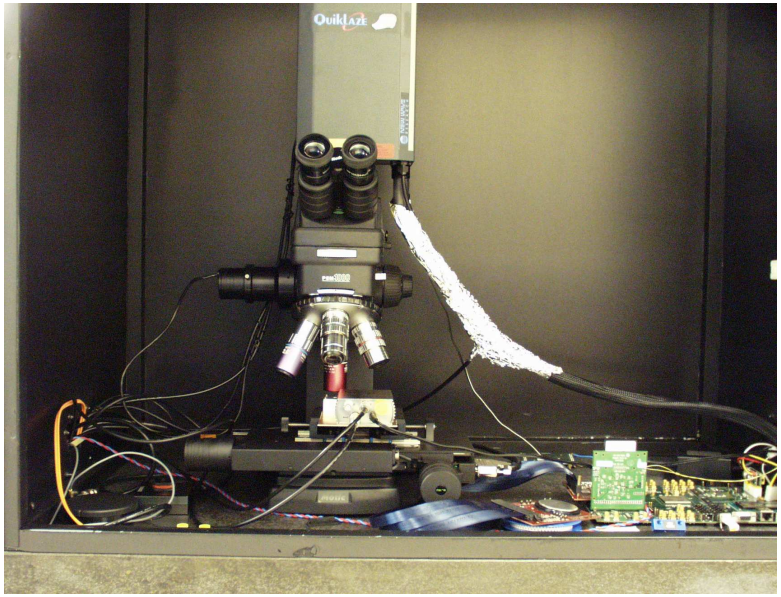
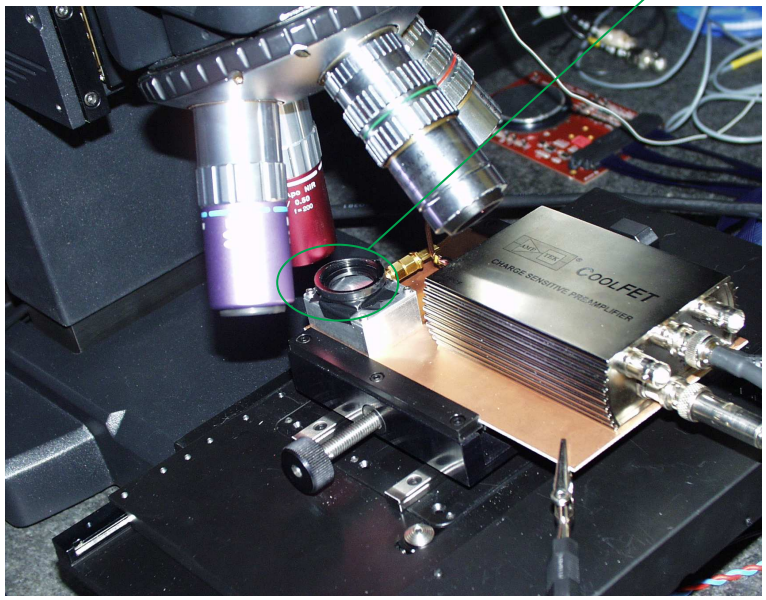
CALICE pixel Laser testing update



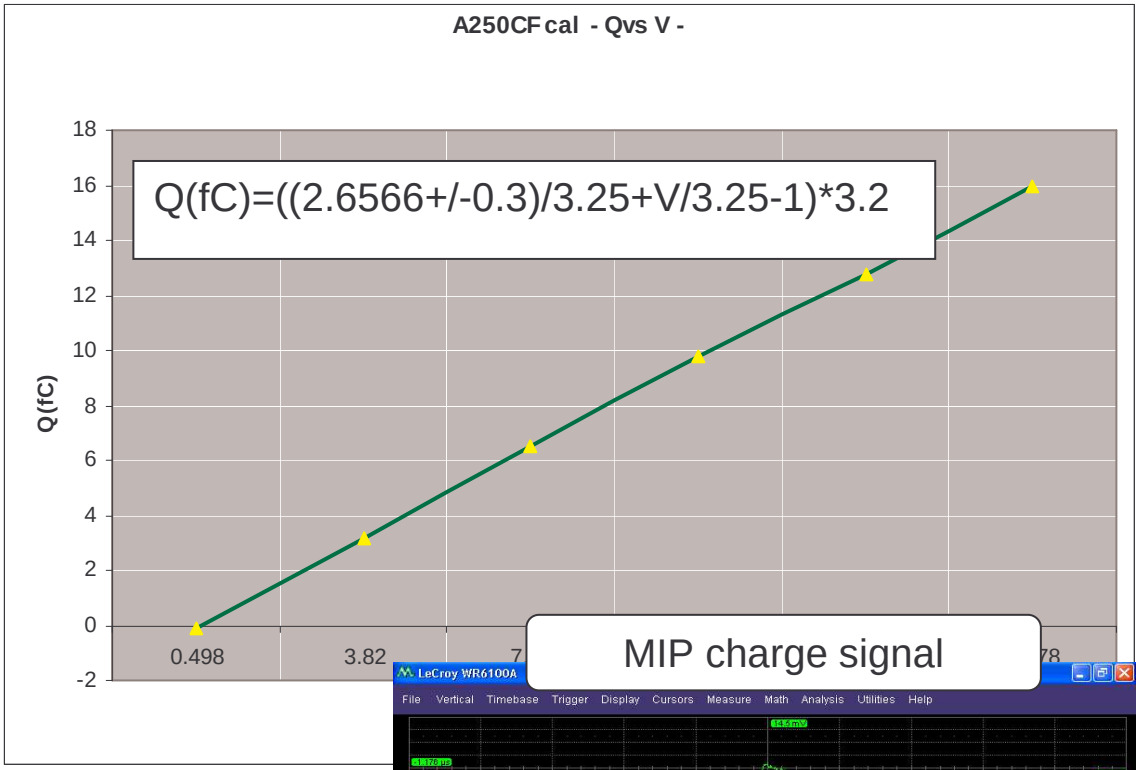


Laser MIP equivalent calibration update

- Si detector coupled to low noise CA + differentiator (no shaper)
- Amplifier Gain measured ~ 7mV/MIP (c.a. 3 times lower than nominal value, confirmed with manufacturer)
- Amount of stray light reduced by using a small dark cylinder around the sensor

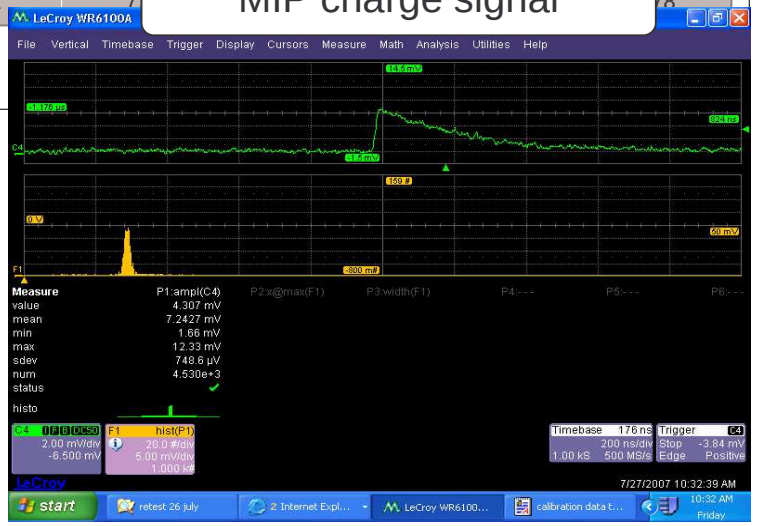
CALICE pixel Laser testing

A250CF calibration using injected charge through capacitor and pulse generator



noise signal

MIP charge signal



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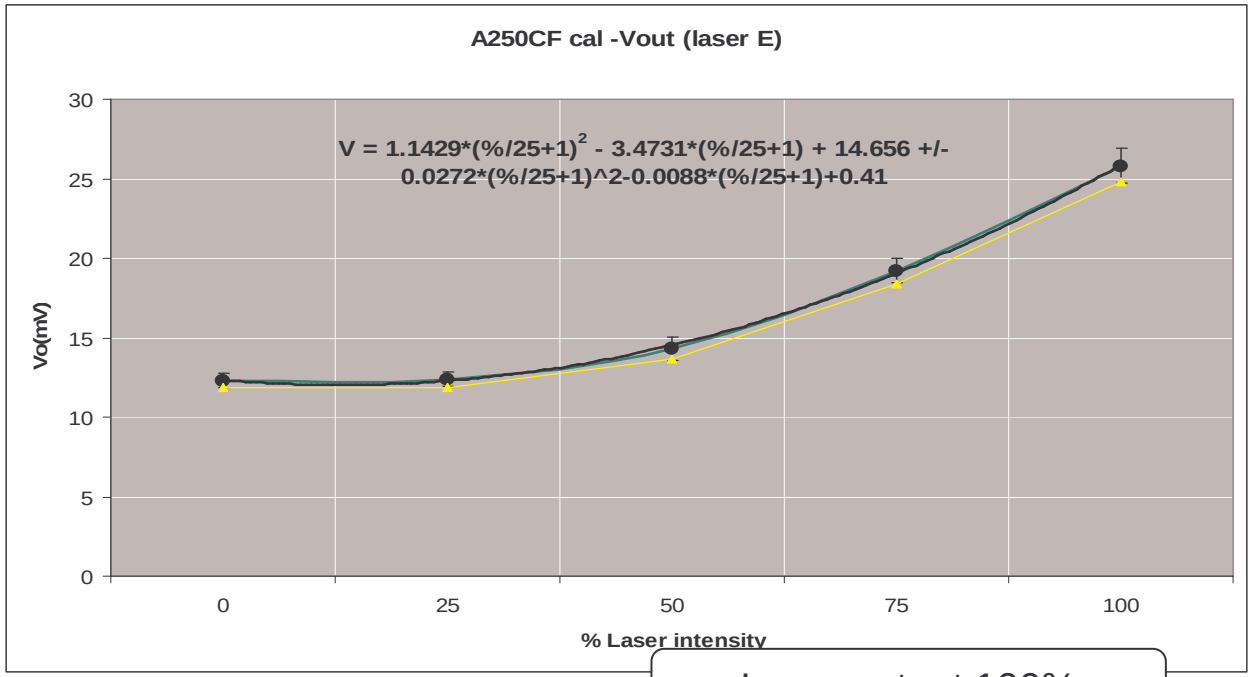
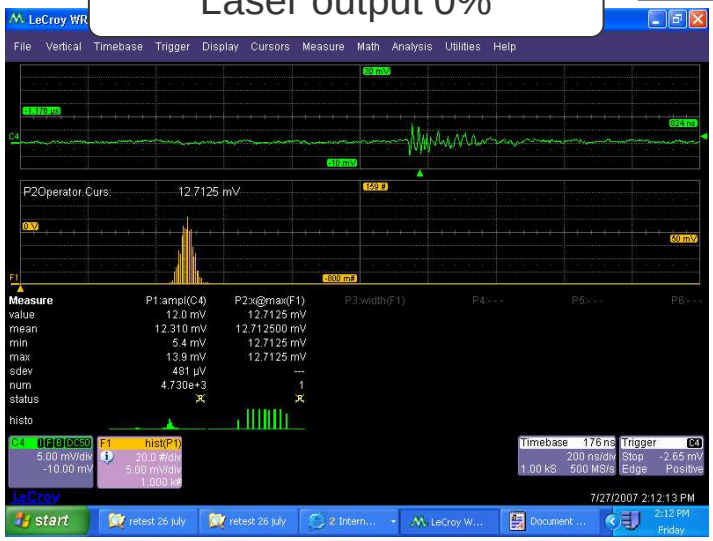
CALICE pixel Laser testing

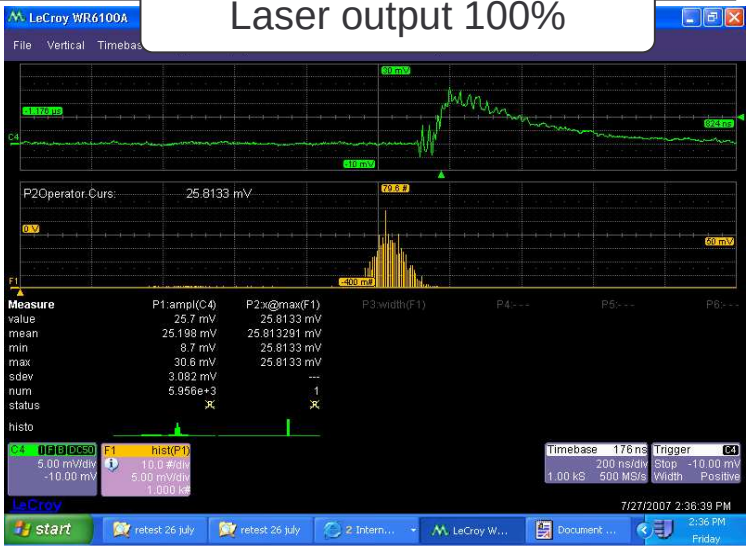
Laser output measurement - Vout vs % intensity.



Laser output 0%



Laser output 100%



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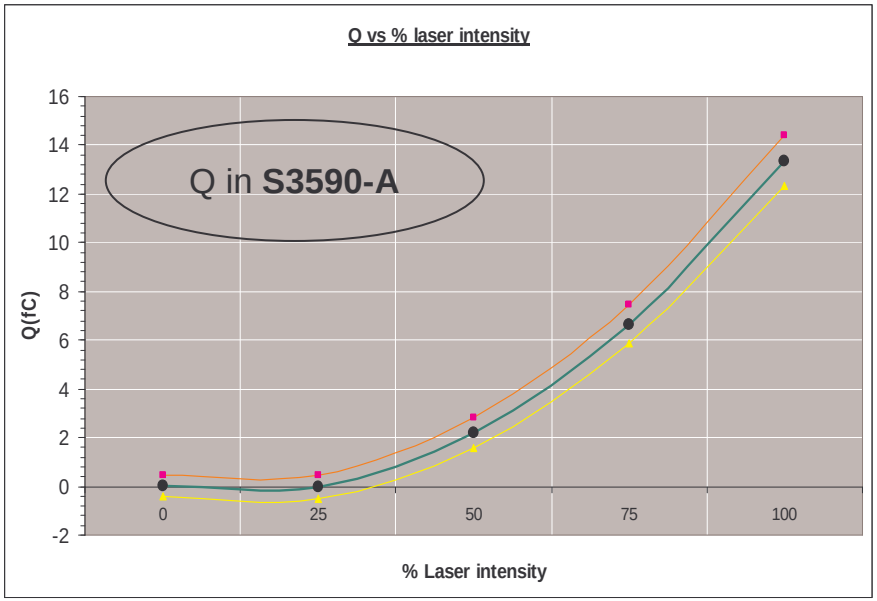
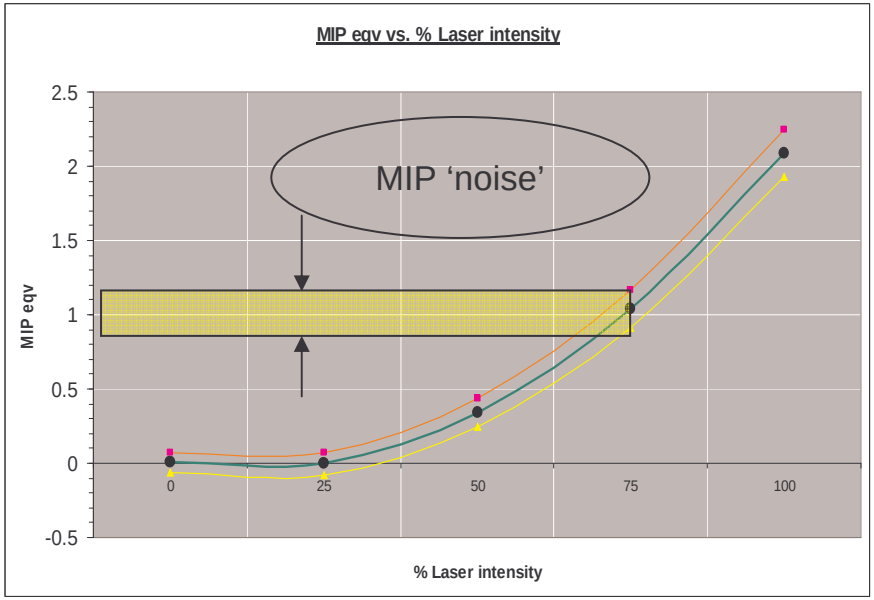
CALICE pixel Laser testing

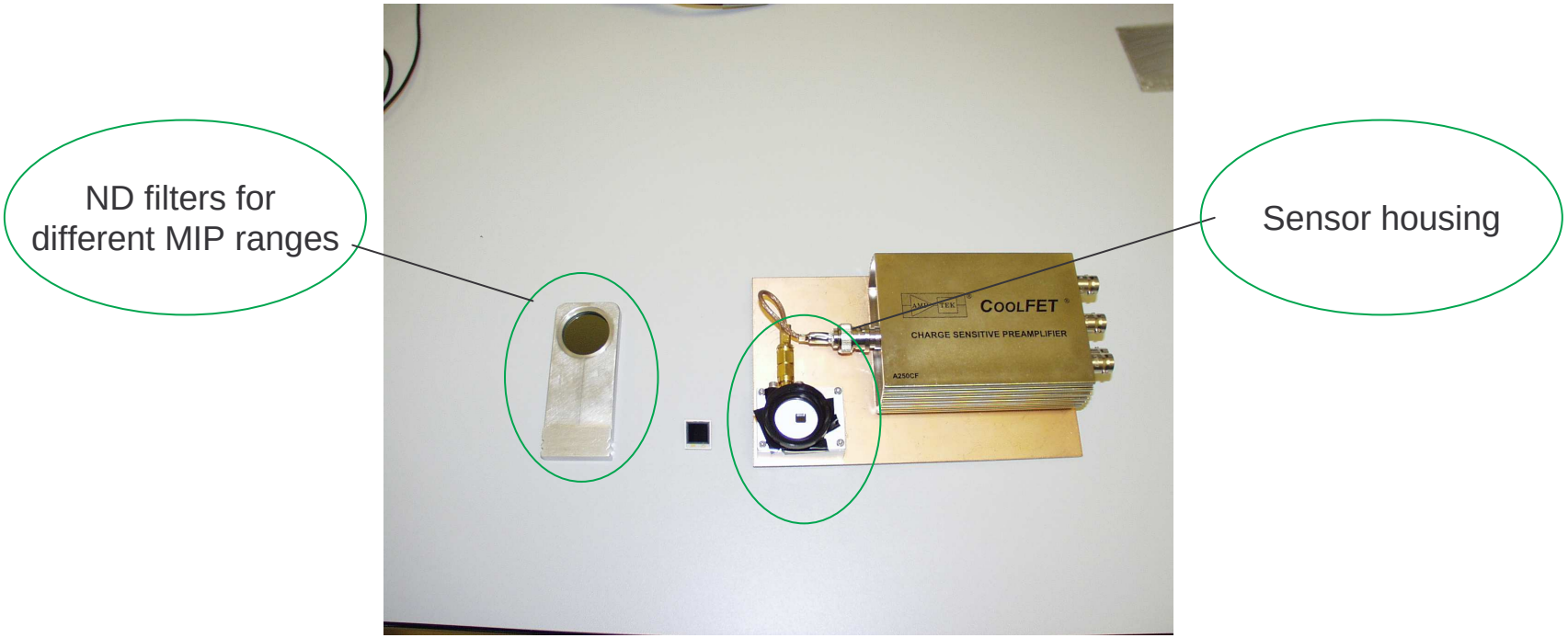




Q generated vs % laser intensity – MIP- eqv generated vs % laser intensity with EMI and amplifier noise quadrature-subtracted

MIP-eqv calibration accurate to +/-15%

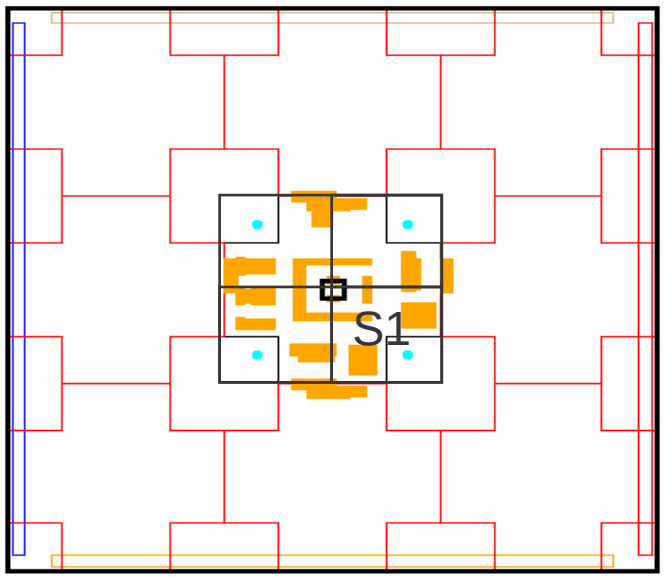
CALICE pixel Laser testing

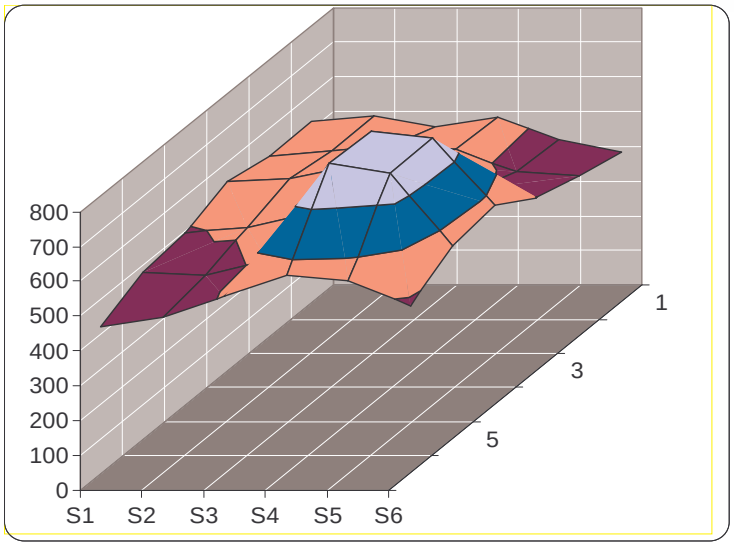


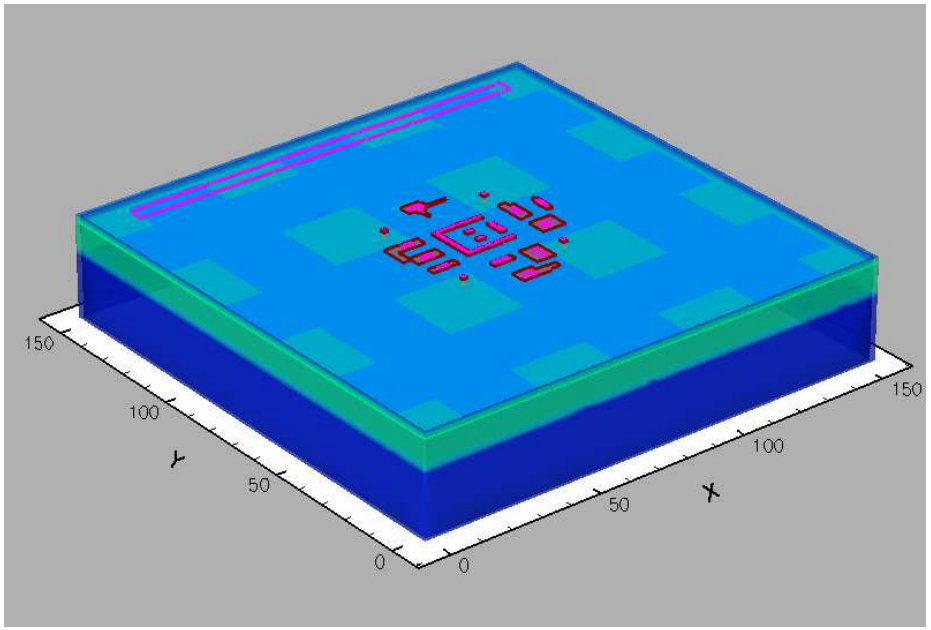
Next step:

- Refined calibration using non coated sensor and thru-hole sensor housing (back scattered light, non uniformity of thickness)
- Study of laser temporal profile (for deconvolution of sensor response)
- Comparison of Laser signal with radiation source signal
- Calibration using different MIP ranges
- SW control from DAQ

CALICE pixel Deep P-Well simulation







3D simulation of final layout with all around DPW

$\Delta Q \sim 10\%$ @ $2.2*10^5$ points

c.a. 40 hits points simulated

Conclusions

- Laser sub-MIP calibration accomplished: further refinement and verifications ongoing
- Full pixel simulation with final layout ongoing