

Feature in hit maps?

Mechanical ?

All layers look similar, the chance that there is a glue bump pressing on a sensor is low

Investigate ?

First layer has no mechanical contact / data from SPS and PS from single modules

# Electric ?

POWER 1.95V 5.21 Amp

$$P = 9.89 \text{ W}$$

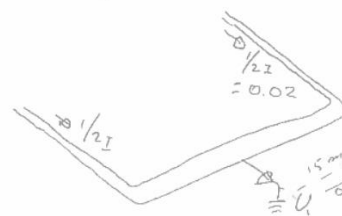
DVDD : AVDD  $\approx 17:10$

$$P_{DVDD} \approx 0.129$$

$$P_{AVDD} \approx 0.076$$

$$P_{TOT} \approx 0.206$$

$\rho_{AL} \approx 26.5 \text{ m}\Omega\text{-m}$



$$R = \frac{26.5 \times 10^{-3} \cdot 1.7 \times 10^{-3} \cdot 3 \cdot 50 \times 10^{-6}}{16 \times 10^{-9}}$$

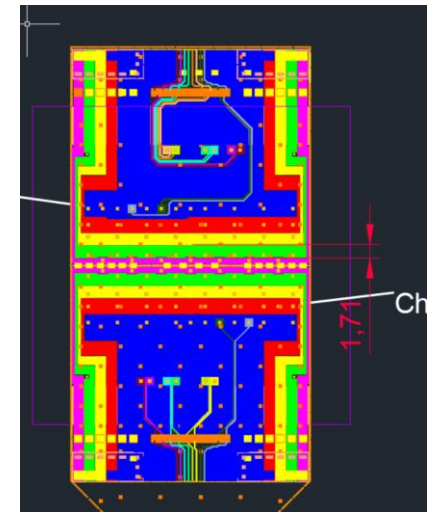
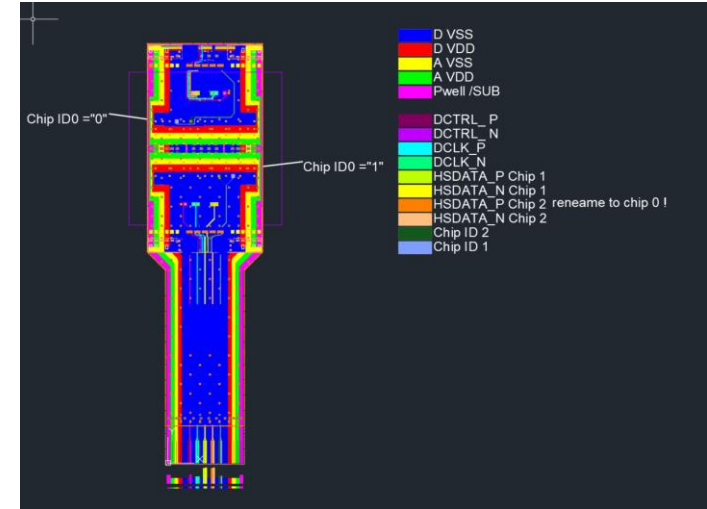
$$= 0.0047 \Omega$$

$$dU = 0.0047 \cdot 0.02$$

$$\approx 0.1 \text{ mV}$$

Connections are symmetric.

Voltage drop on analog supply is very low 0.1mV



Temperature ?

POWER 1.95 V 5.21 Amp  
 $P = 9.89 \text{ W}$

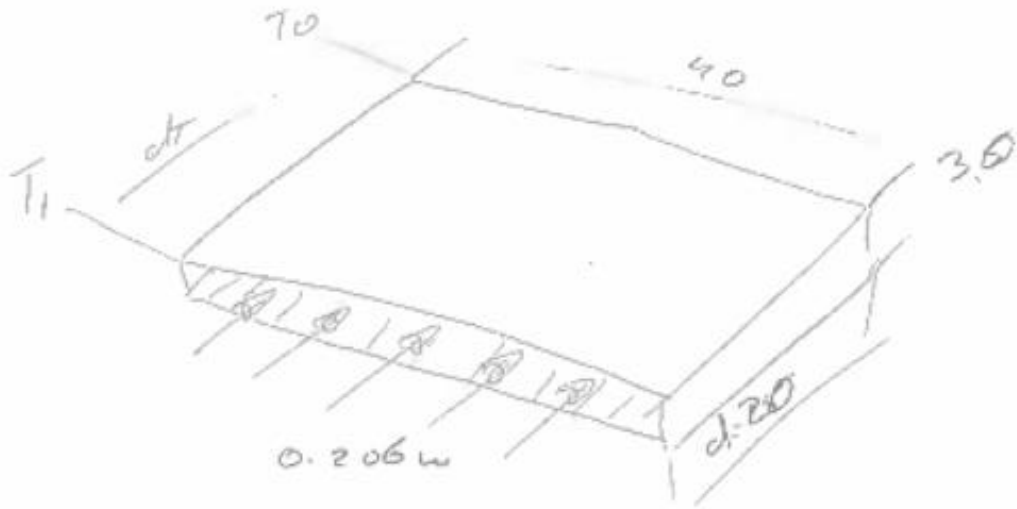
DUDD : A<sub>UDD</sub>  $\approx 17:10$

$P_{DUDD} \approx 0.129$

$P_{AUDD} \approx 0.076$

$P_{TOT} \approx 0.206$

$\omega = 173 \text{ W/m}\cdot\text{K}$

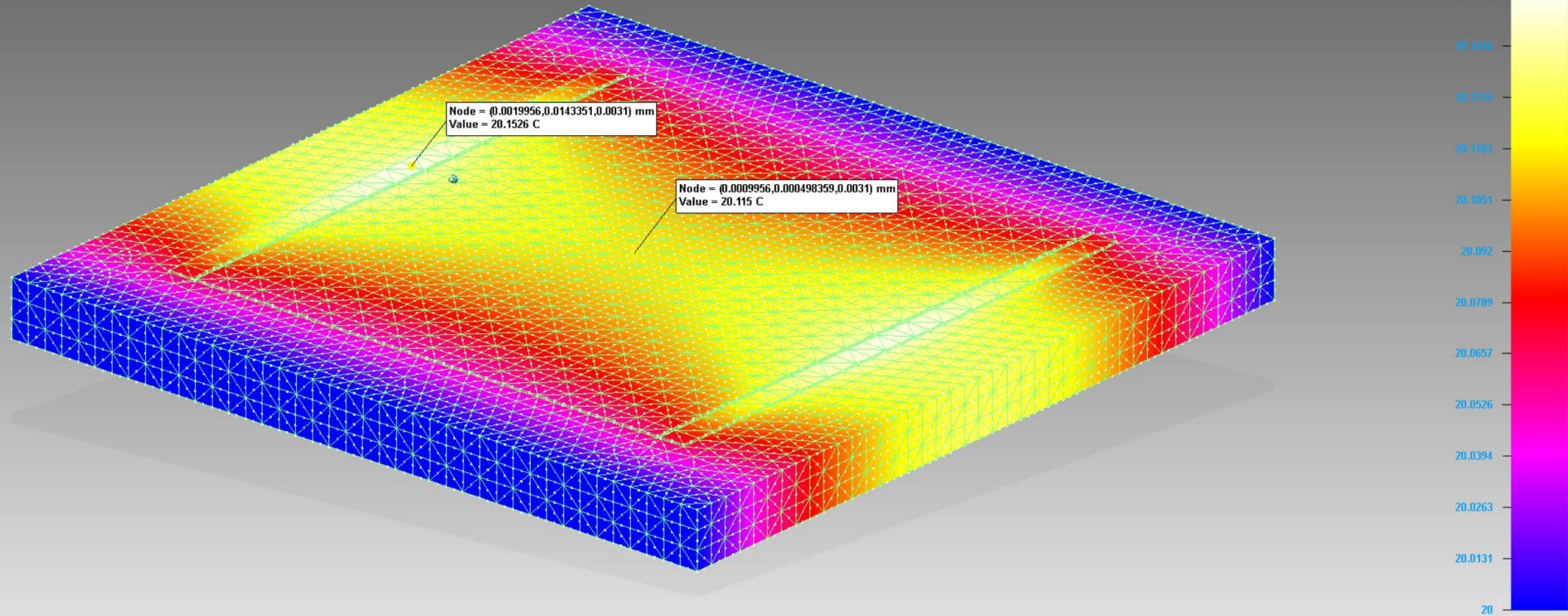
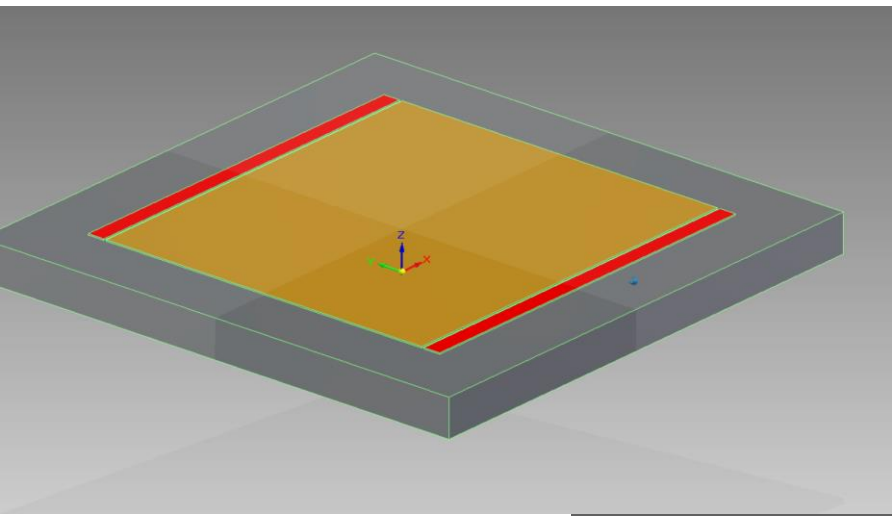


$\rho = \frac{k \cdot A \cdot dt}{d}$

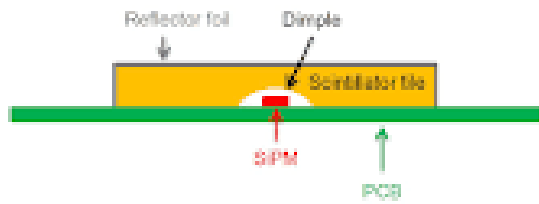
$dt = \frac{0.206 \cdot 20 \cdot 10^{-3}}{173 \cdot 40 \cdot 10^{-3} \cdot 3 \cdot 10^{-3}}$

$\approx 0.198 \text{ }^\circ\text{C}$

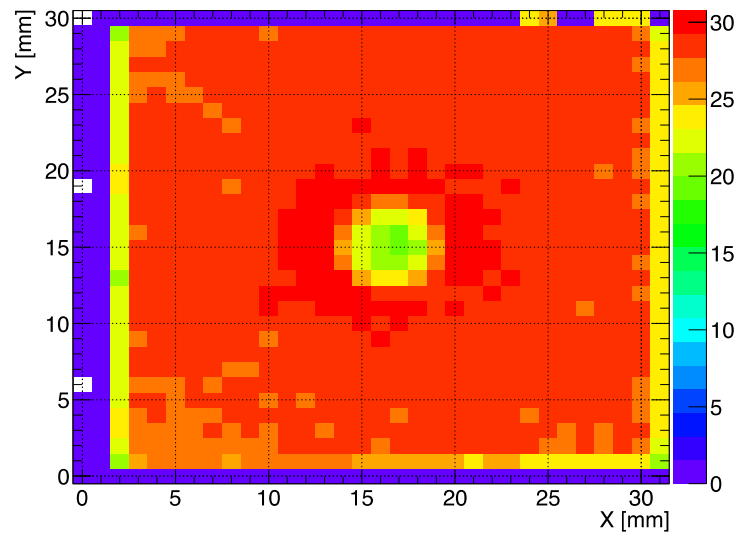
Contact to cooling fixed at 20 degree Celsius  
Digital area 2x 0.129 watt  
Sensor area 2x 0.078 watt



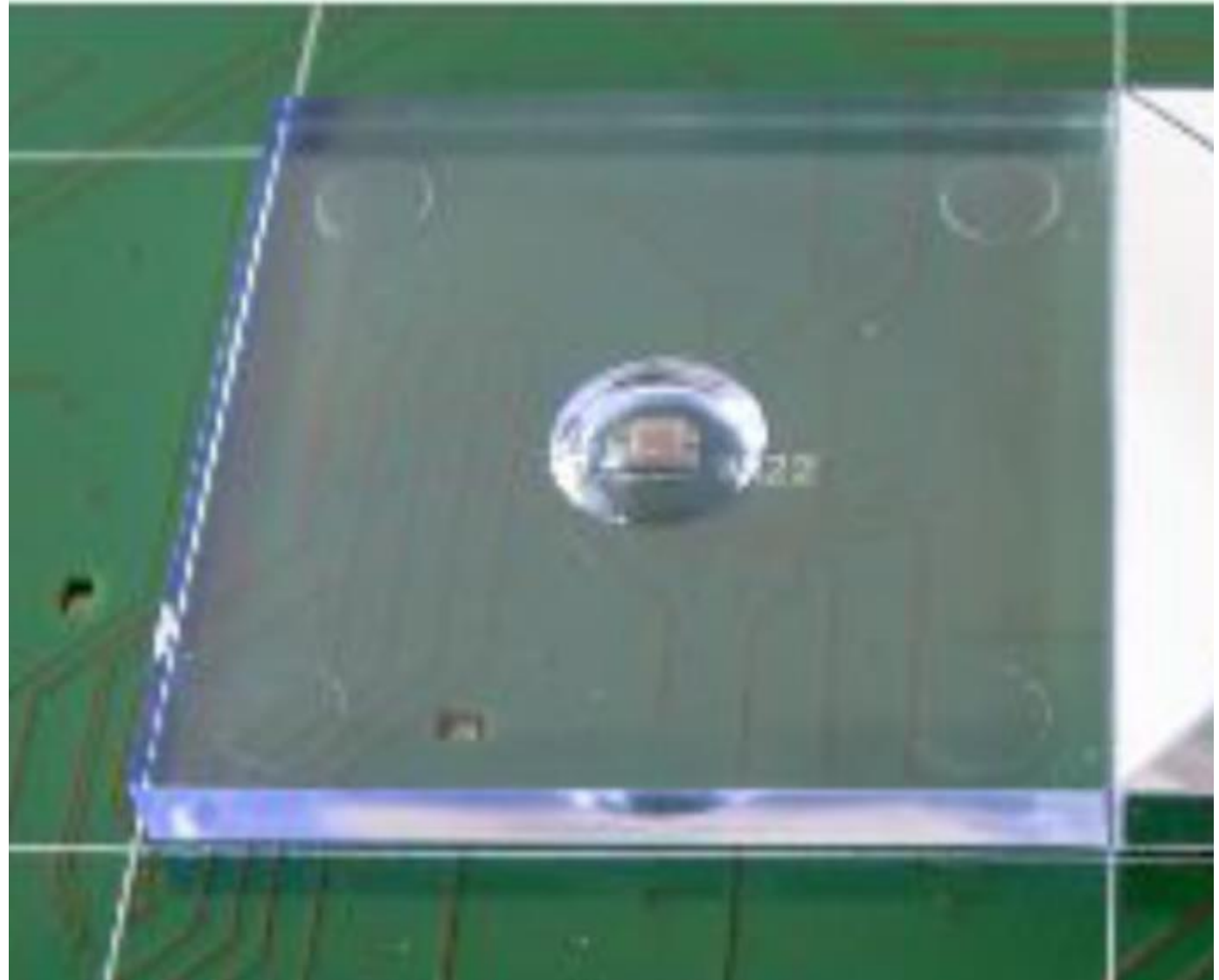
Trigger scintillator?



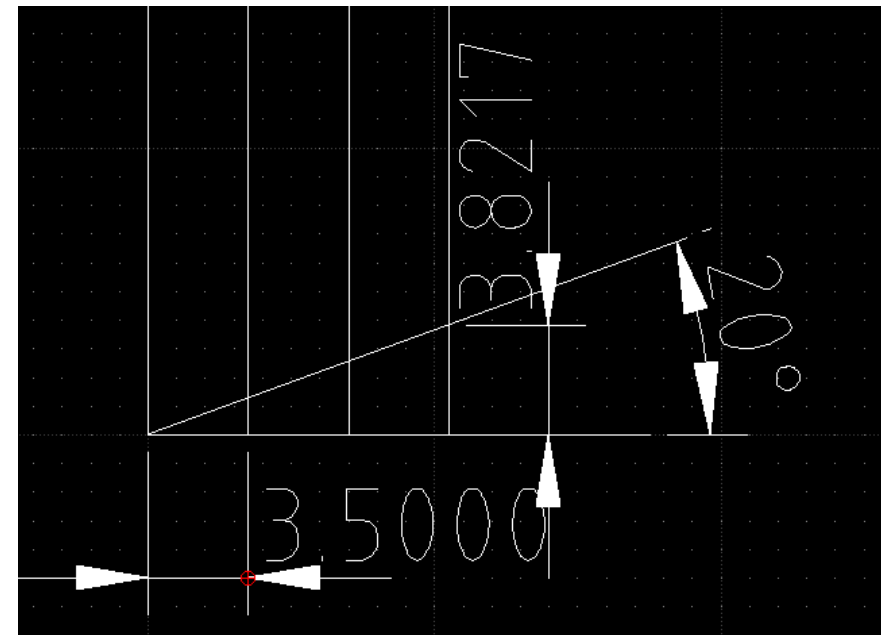
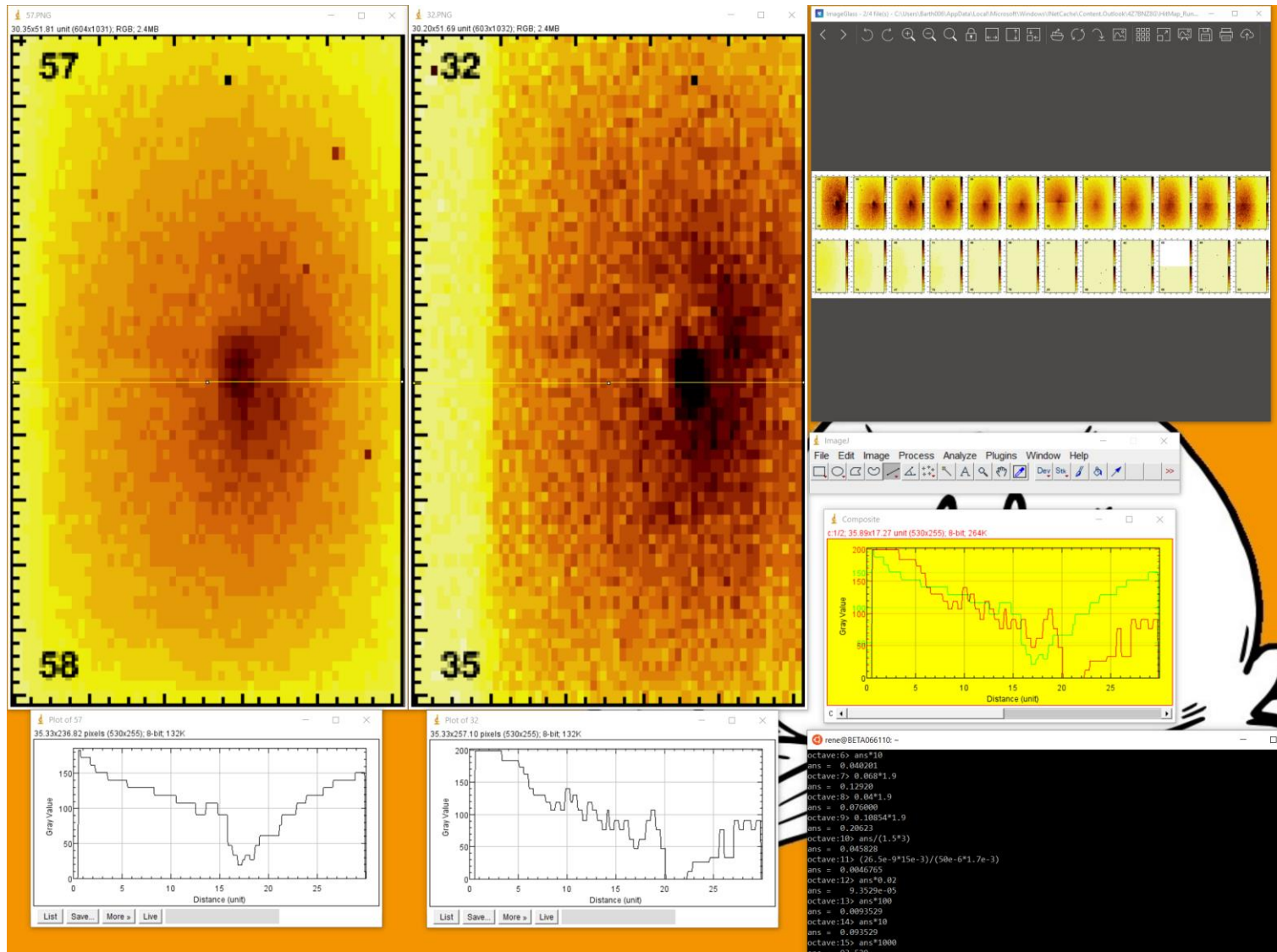
Averaged Energy Deposition vs. XY Position



Uniformity scan with Sr90







In the 20 degree angle scan the feature seems to move from layer to layer in approximately the expected distance.