

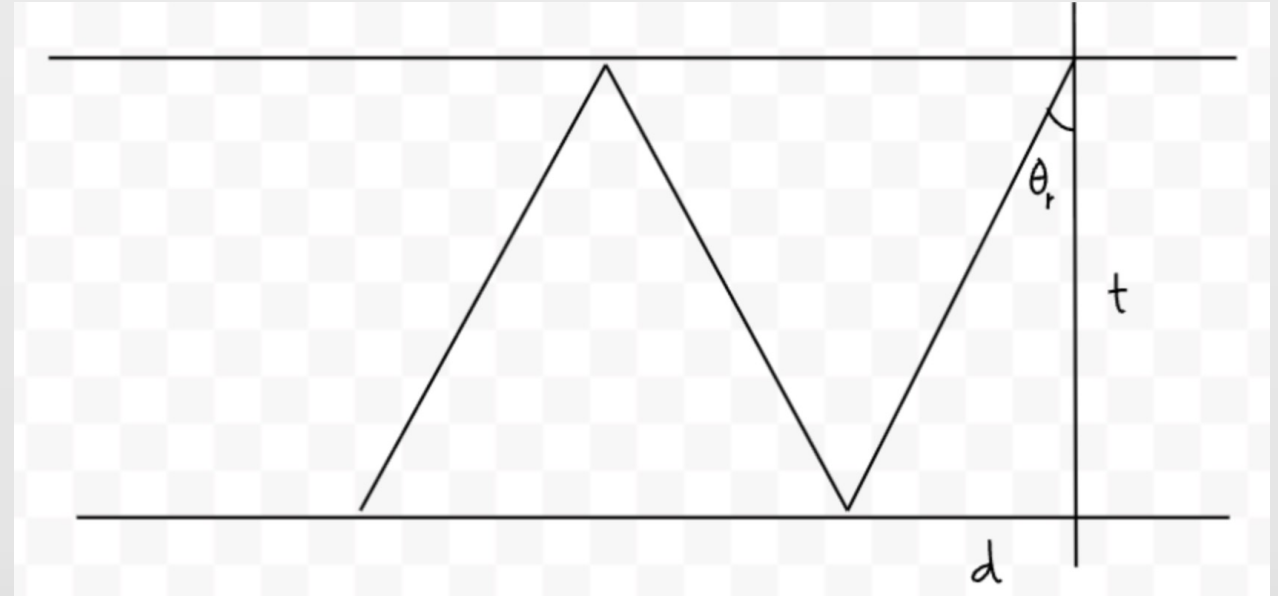
Optical MC for Tile Profiles



THE OHIO STATE UNIVERSITY

Idea

- Can we scale from e.g. 5x5x0.4cm tile to 5x5x1.6cm with basic optical toy model?
- Use material index of refraction and gaussian sampling for beta electron angle and shower photon angle for number of bounces to reach SiPM
- Use paint reflectivity for survival probability.

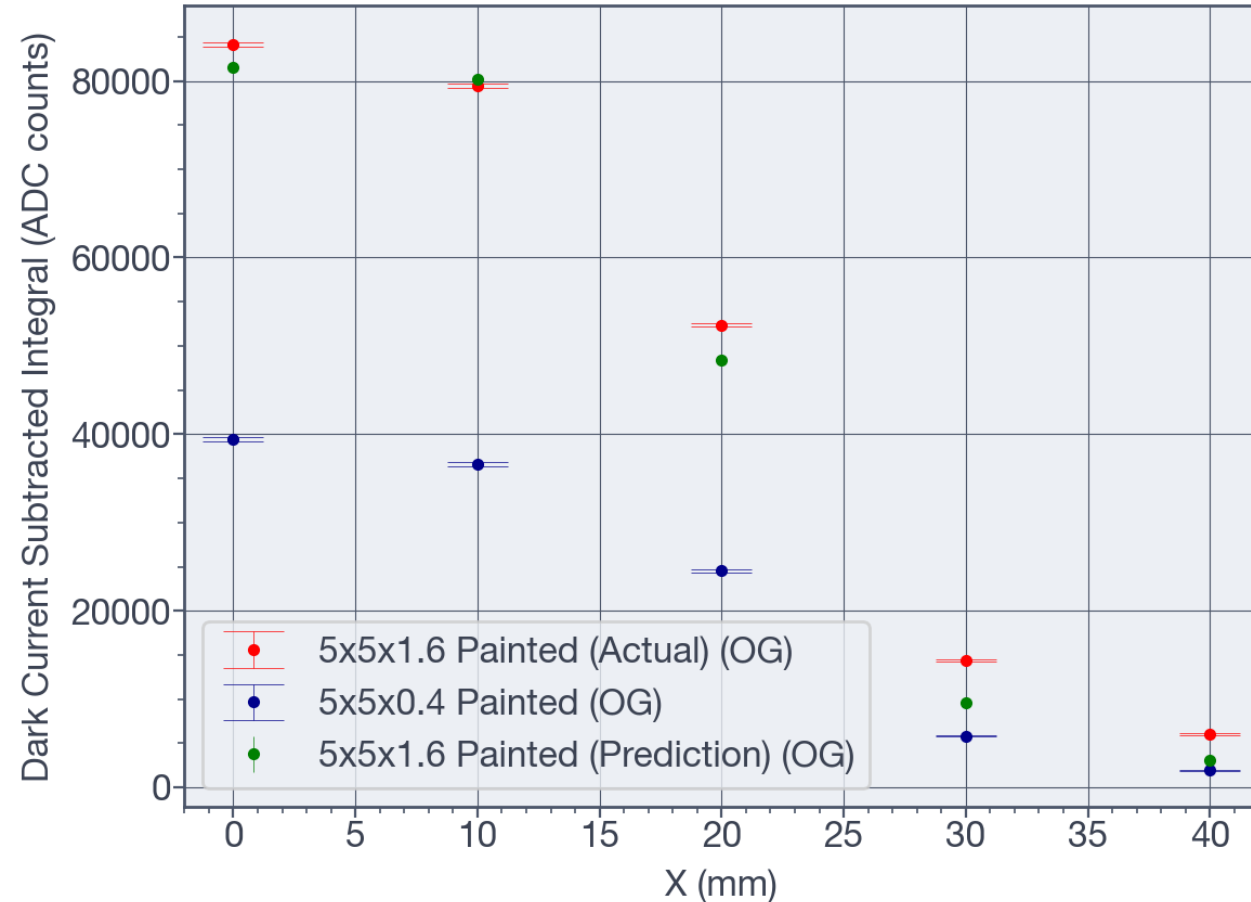


Predict a yield ratio between two tiles->testable and could be used to extrapolate from one tile to another.

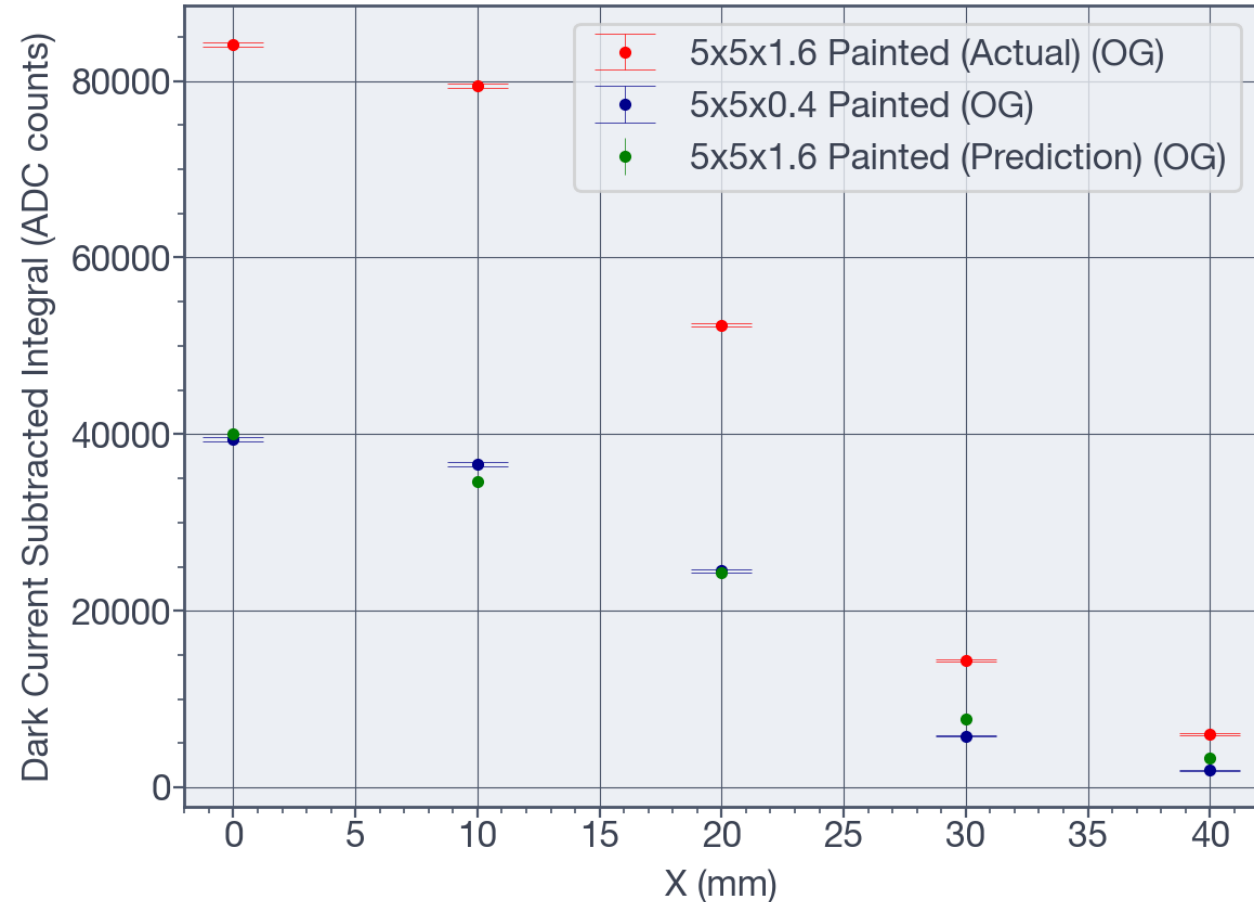
$$y \propto R^{N_b} \rightarrow \frac{\ln y_1}{\ln y_2} \sim \frac{N_{b1}}{N_{b2}}$$

Thickness extrapolation

Horizontal Profiles w/ Offset, Closest yet



Horizontal Profiles w/ Offset, Closest yet



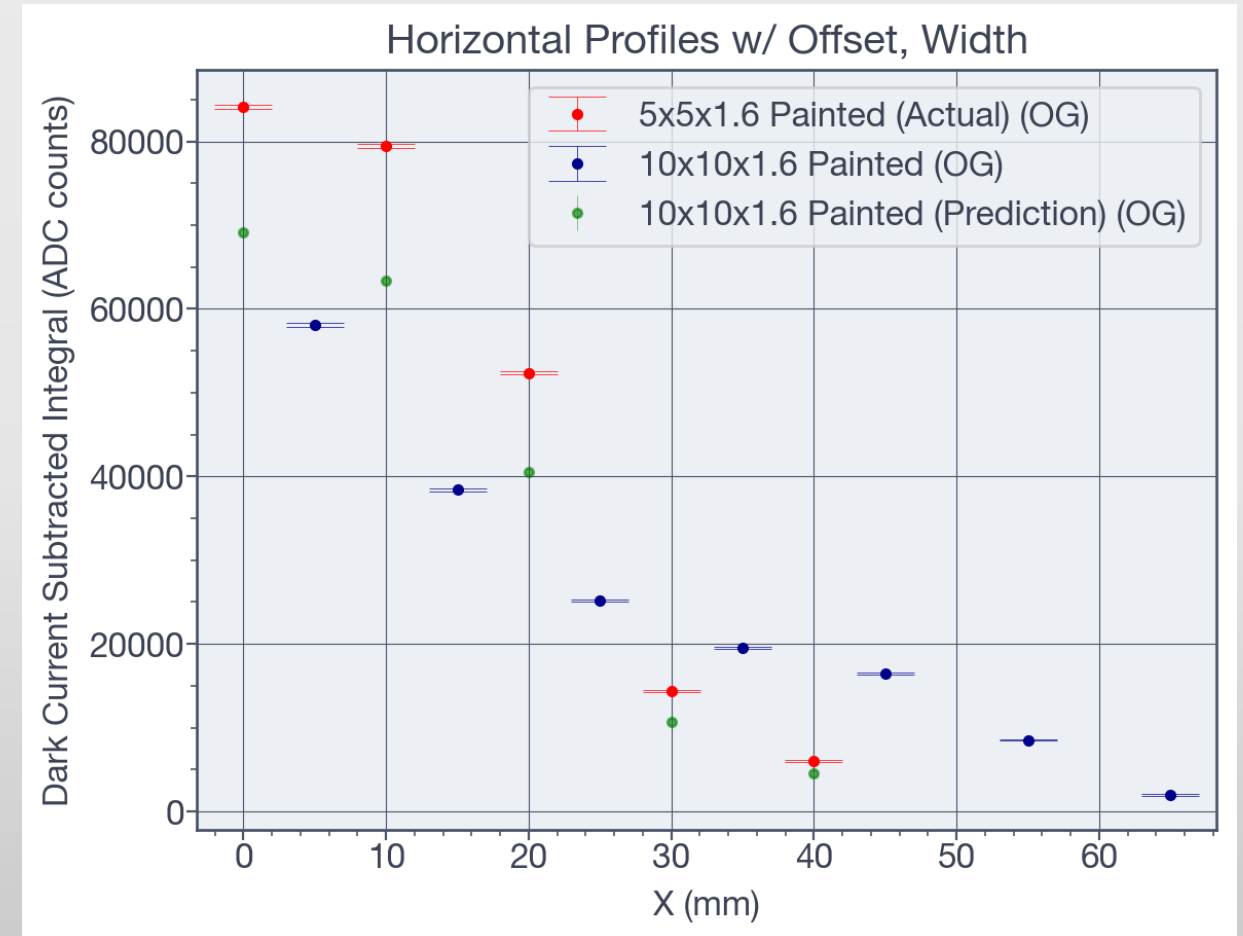
From thin tile, predict thick tile

From thick tile, predict thin tile

→method is commutative!

Width extrapolation (WIP)

- Also can try to use this to extrapolate from one width to another.
- Not as good as thickness conversion
- We think it's because we are currently sampling in 1D and need 2D. Jeff is working on it!



By the way: all credit to Jeff Wilden for details and implementation!