

nHCal DRC 5/13/25

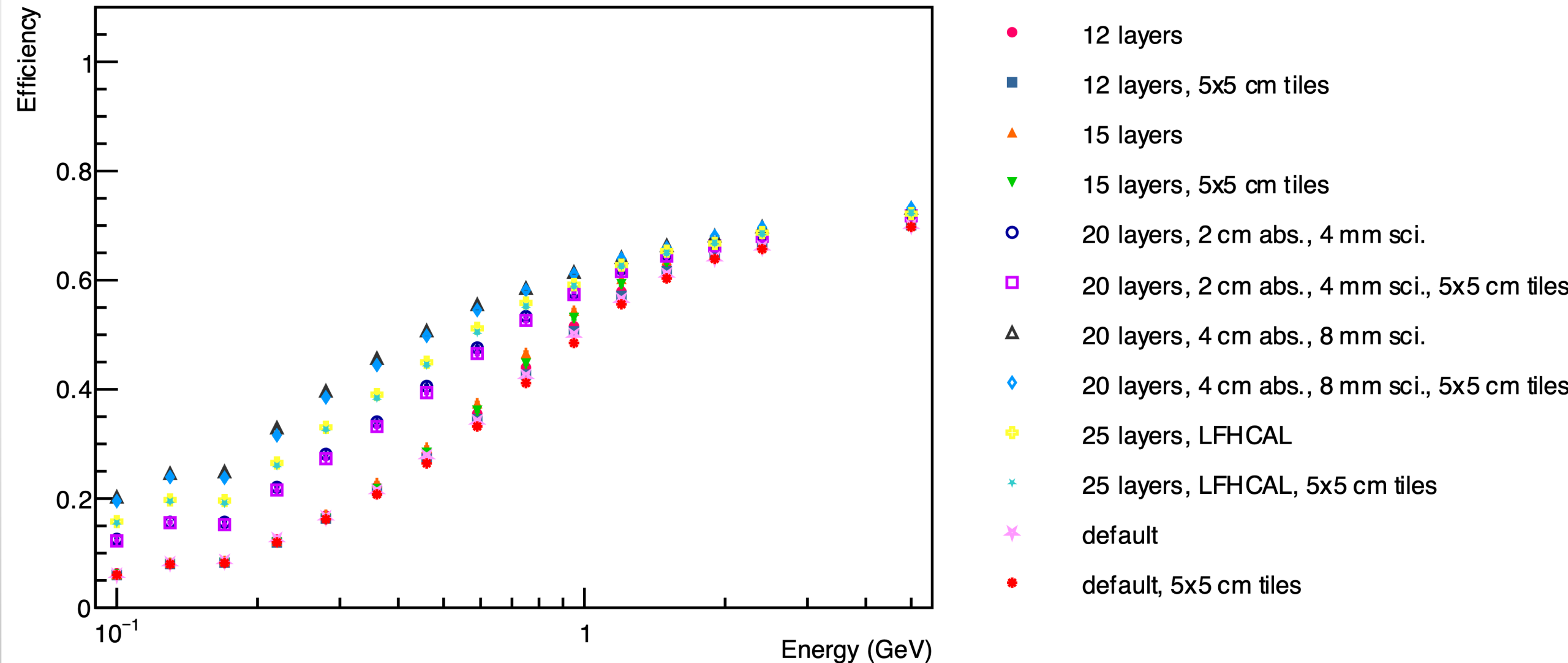


THE OHIO STATE UNIVERSITY

Neutron Detection Efficiency by Configuration

- Procedure:
 - Generate neutrons in nHCal acceptance (uniform $133 < \theta < 177$) with npsim
 - For each hit, check if the contributions reached the energy threshold ($0.25 \times E_{MIP}$, where $E_{MIP} = 0.75$ MeV) within 100 ns (t_{int}) of the first registered contribution.
 - Calculate efficiency, where numerator is all hits passing this check and the denominator is the total number in the nHCal hits collection-so the number of events I simulate.
 - Repeat for many neutron energies between 0.1 and 5 GeV, for each configuration.

Efficiency vs Energy



- I don't consider this done; Leszek and I are surprised that the efficiency is not ~100% at high energy. We are working on figuring it out.
- However, we can see a "hierarchy" of efficiencies for different configurations.