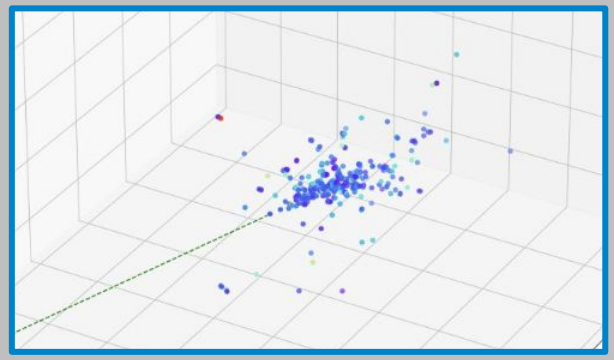
EIC Tracking WG Meeting

Imaging Calorimetry for EM Barrel with ToF



ANL EIC Calorimetry Team
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Maria Żurek, 06/22/2021

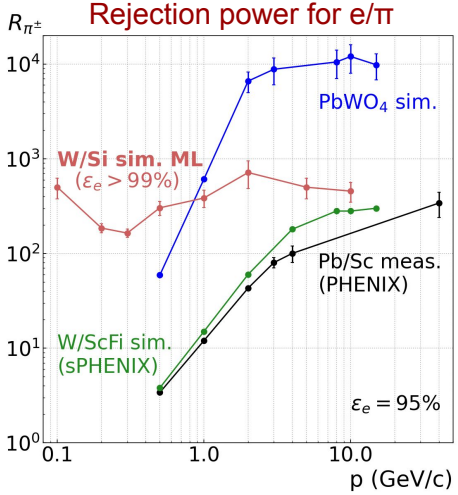
Imaging calorimeter based on monolithic silicon sensors

AstroPix (developed for NASA, off-the-shelf)
https://arxiv.org/pdf/2101.02665.pdf

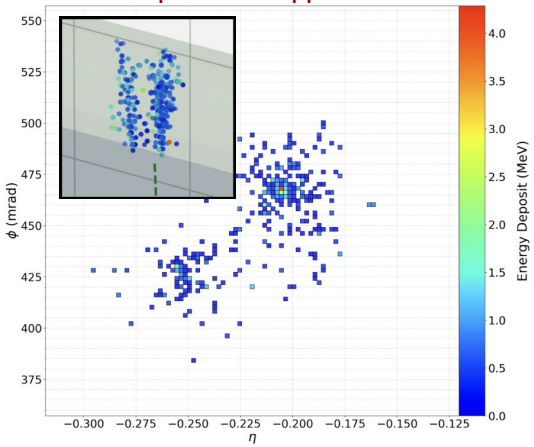
- Have no stringent power and cooling requirements (used in space)
- Energy resolution: 2% within dynamic range (20 keV ~ a few MeV)
- Time resolution: 50 ns

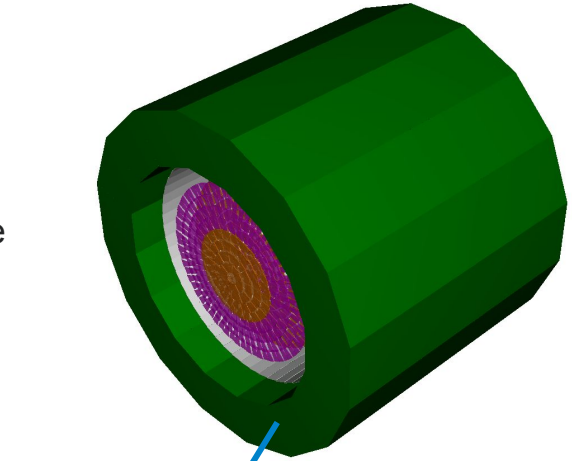
Ongoing design optimization using the simulation with ATHENA software framework with **AstroPix digitization, 3D clustering, ML algorithms,** …
Tests against YR benchmarks: separation, shower separation, spatial and

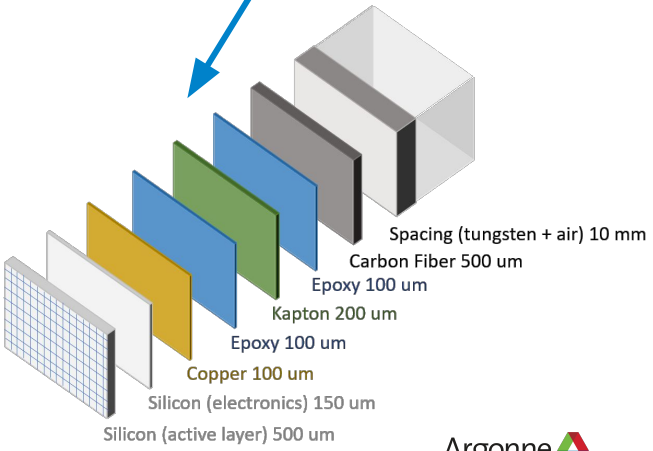
Rejection power for e/π



Example of π→γγ at 5 GeV

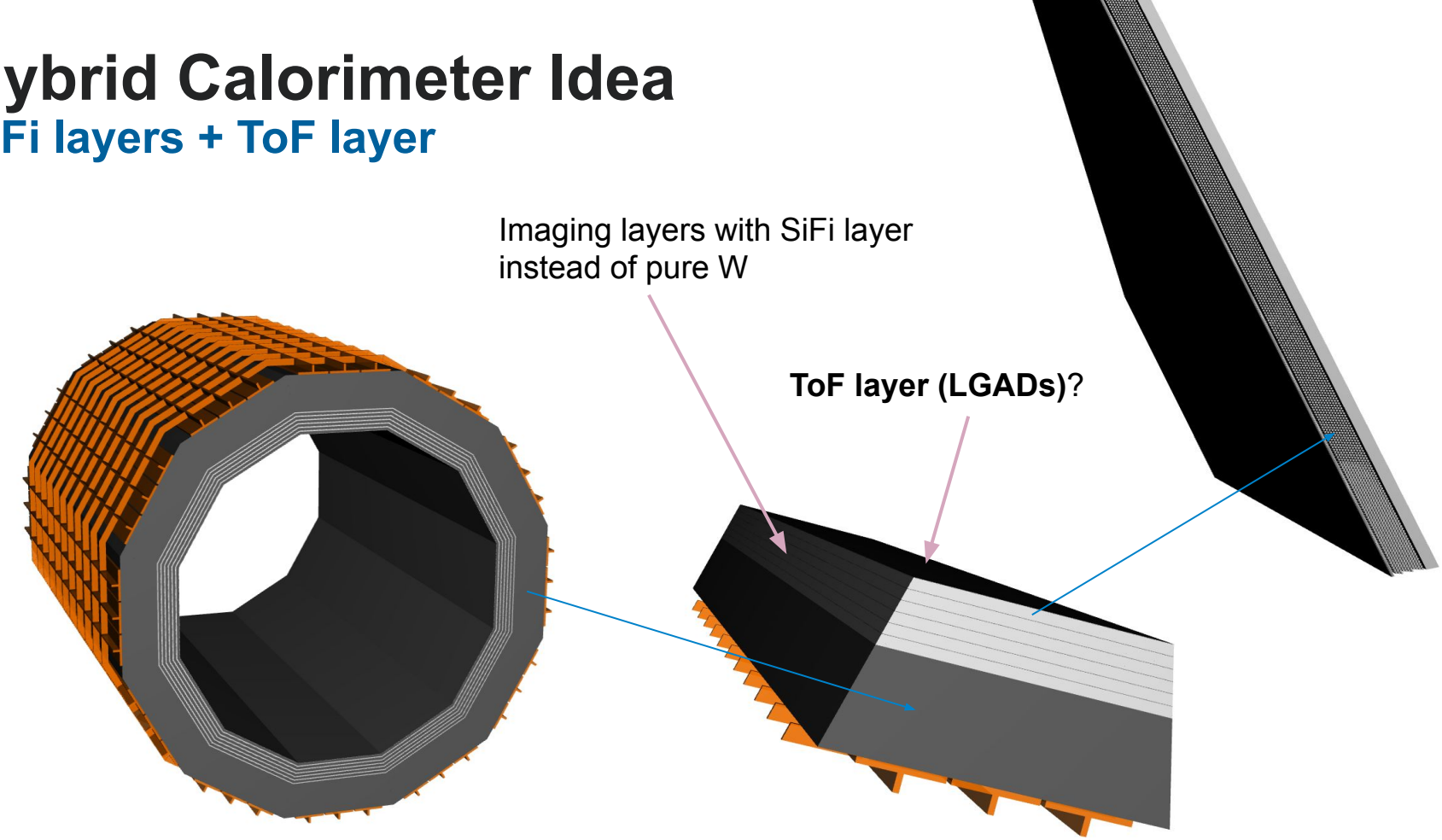






Hybrid Calorimeter Idea

SiFi layers + ToF layer



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