

Why Conditionally Descoping all DOE-US AstroPix Layers is Problematic

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on behalf of the BIC DSC



Descoping the DOE-US AstroPix layers kills *all* layers

Korean in-kind layers cannot be built without the US effort

Under current funding assumptions, ‘delay’ has the same practical effect as descoping during construction.

Who is to be defunded for production in the current mitigation strategy?

Argonne National Laboratory 
Mechanical components (with Purdue), project management, $\frac{1}{3}$ modules and staves

UC Santa Cruz 
Production tooling, scaling, automation, first module factory, $\frac{1}{3}$ modules and staves

Oklahoma State 
All module PCBs (AstroLinx) and QC

NASA-GSFC 
AstroPix chip support, *all* control and readout electronics

Why this descopes *all* layers

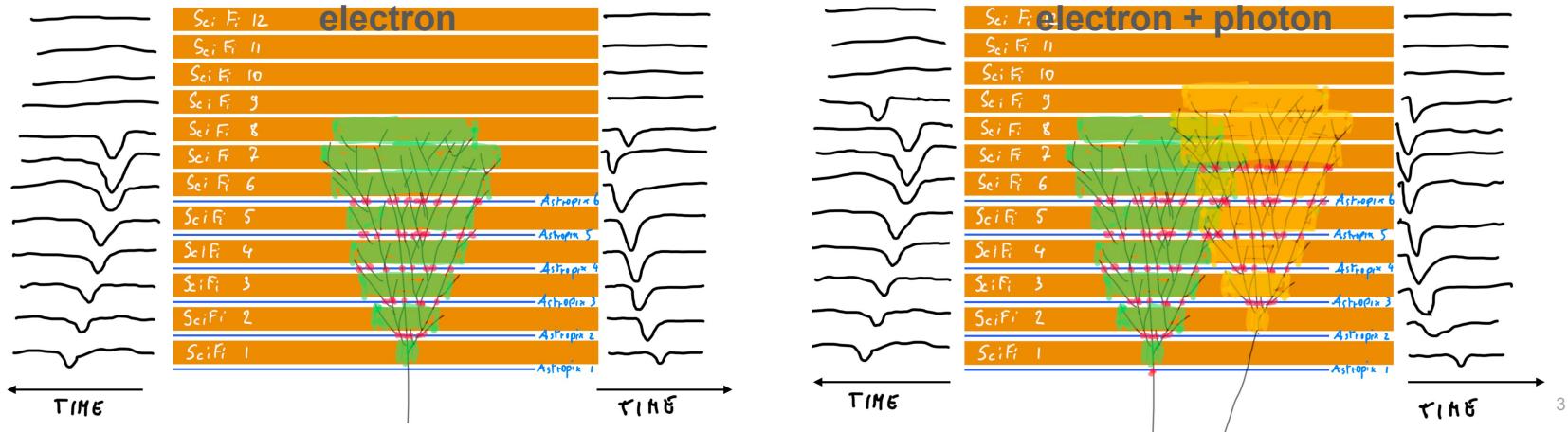
Korea and US efforts are interdependent and it is unreasonable to expect Korean funds will pay for US effort

While contributions are shared, production leadership, infrastructure, and system integration are US-based

‘Delay’ under current assumptions leads to irreversible loss of people, infrastructure, and as consequence the entire AstroPix system.

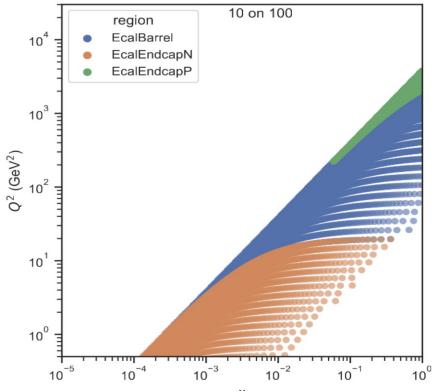
The Barrel EMCal does not work for EIC without AstroPix imaging layers

Unlike GlueX, we are a collider experiment, and we require imaging layers to reconstruct energies when multiple particles hit the same sector.



Physics impact and the role of the collaboration

Immediate and severe physics impact!



- Electron ID for inclusive DIS at medium to high Q^2 , especially at low x
- Significant loss of electron-pion separation for SIDIS in the barrel
- No π^0 ID and reconstruction for exclusive physics and SIDIS
- BIC without imaging layers can't properly separate and reconstruct clusters; this especially impacts photons

This affects all NAS EIC science pillars!

But... We can do better!

There is a good reason ePIC chose BIC with four imaging layers as the baseline configuration, based on EIC Physics

Fully removing the leading institutions behind the imaging layers during construction compromises the entire system, and with it EIC Science

I'm not saying BIC is untouchable, e.g. we could consider delaying the first layer with less impact, but...

...this assessment belongs in ePIC, where we can holistically evaluate cost, schedule, readiness, and physics impact as a Collaboration.