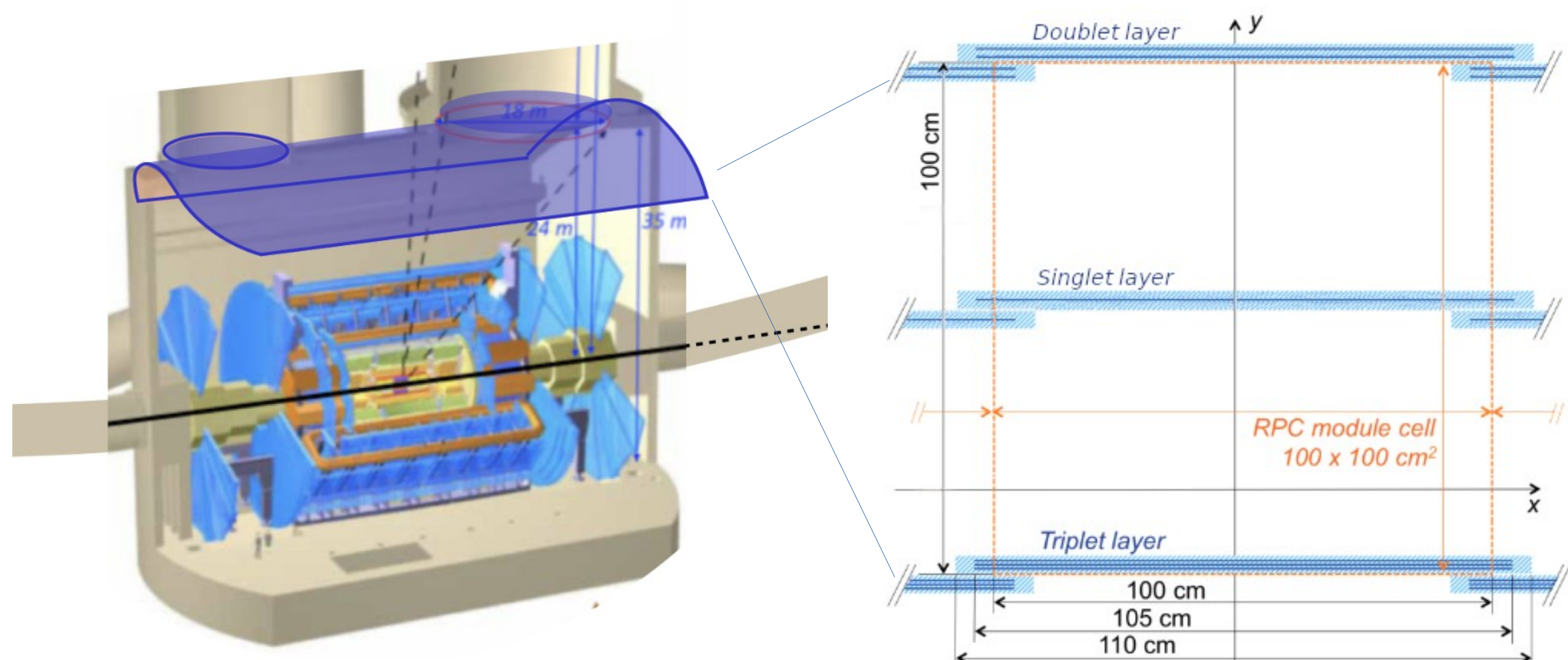


First Commissioning Results from proANUBIS

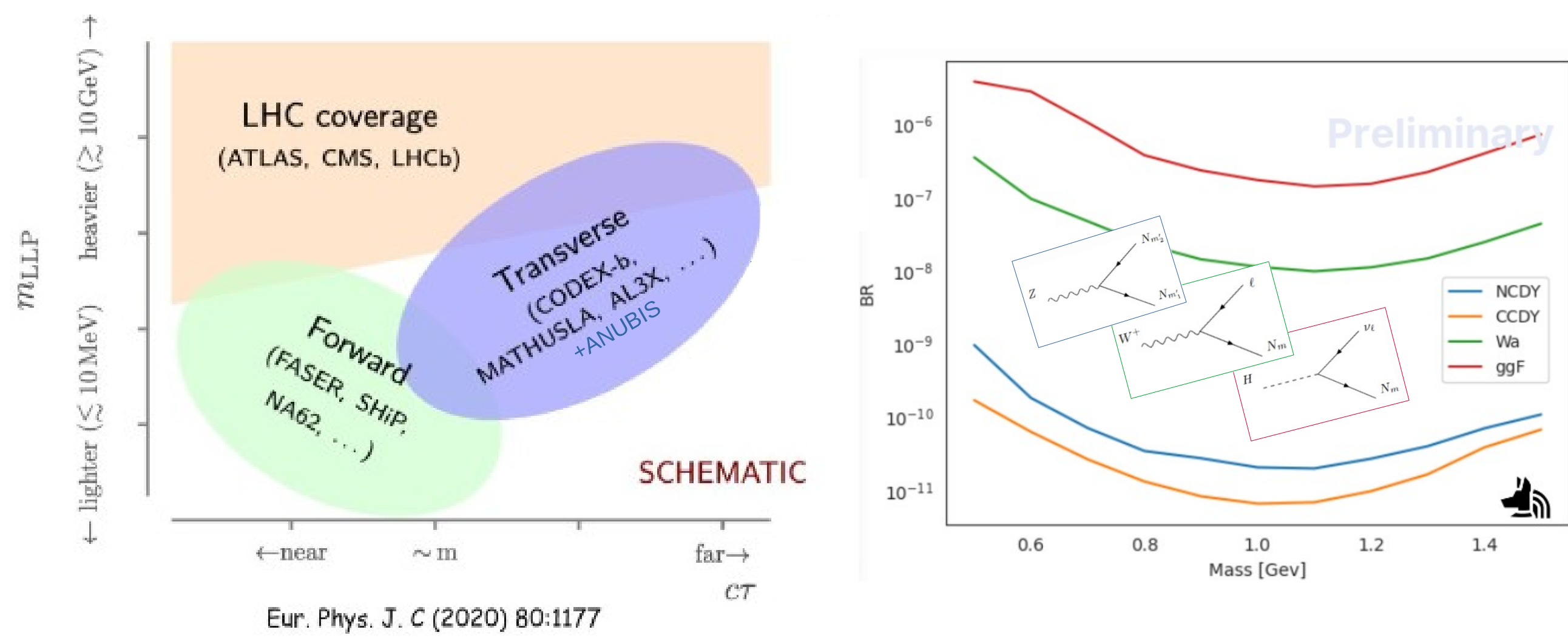
Michael Revering, University of Cambridge
On Behalf of the ANUBIS Collaboration



The ANUBIS Proposal

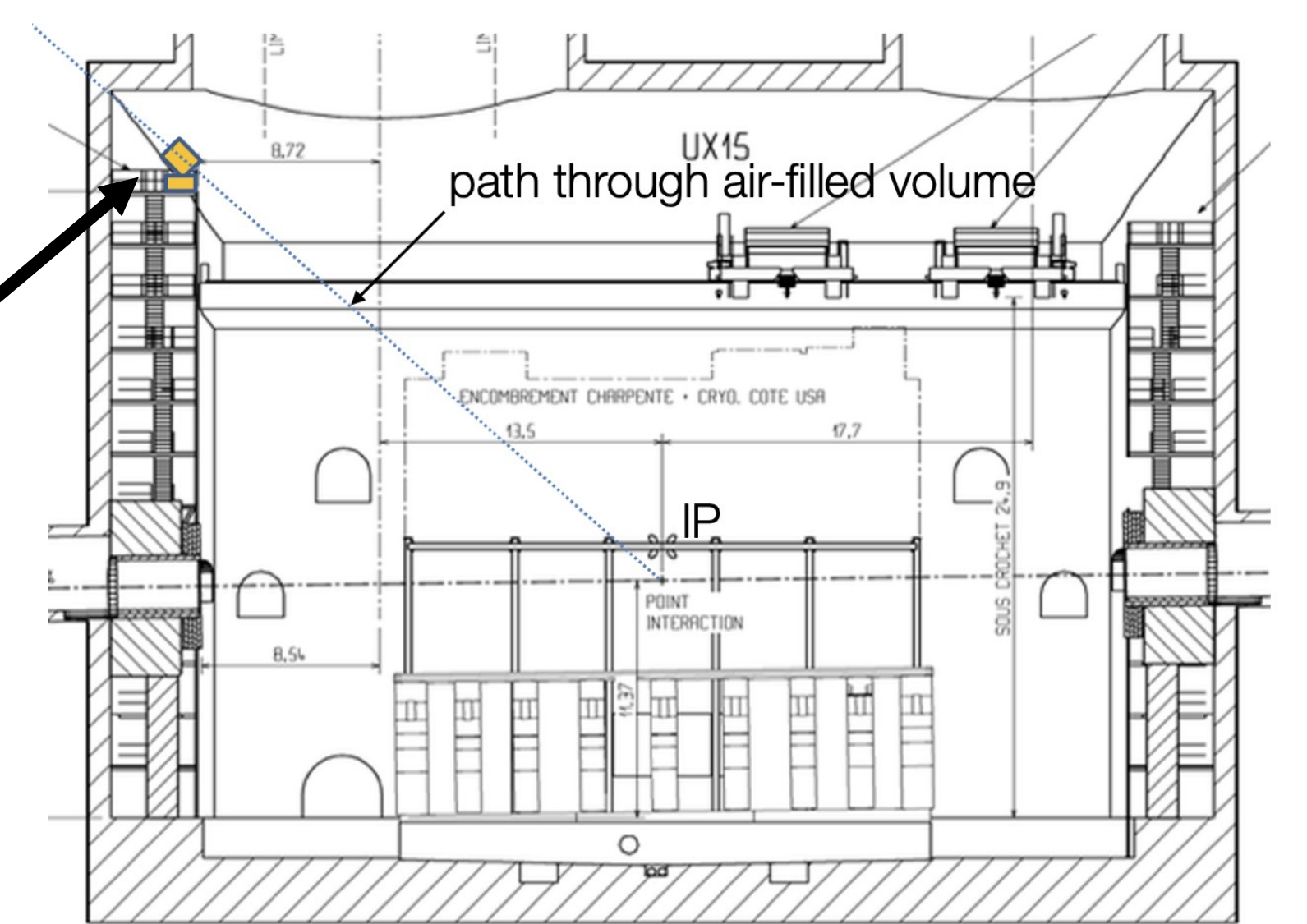
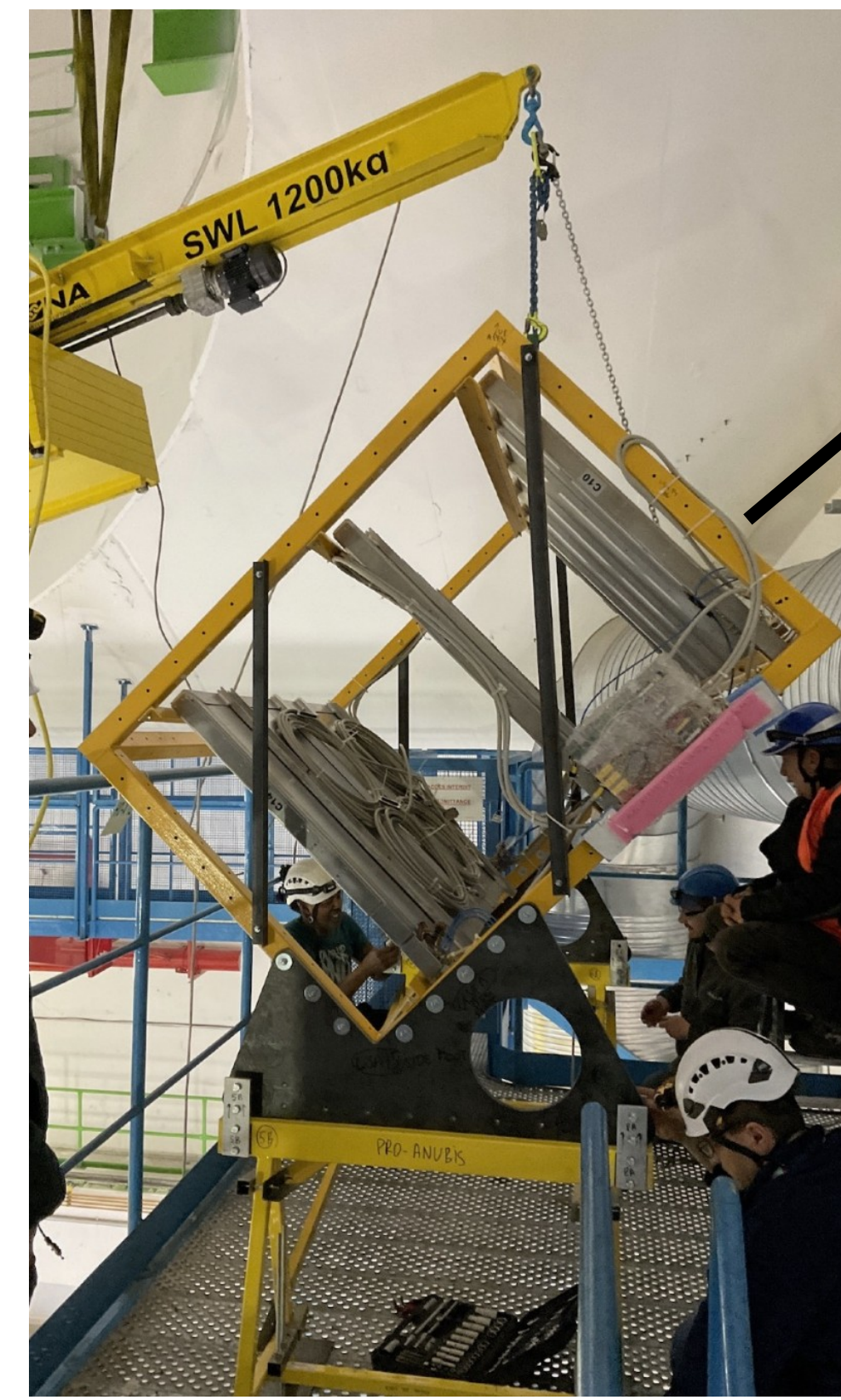


- Install RPC detectors on ATLAS cavern ceiling.



- Extend sensitivity to long-lived particles to $c\tau > 10^6$ m.
- Transverse position allows detection of high-mass mediators.

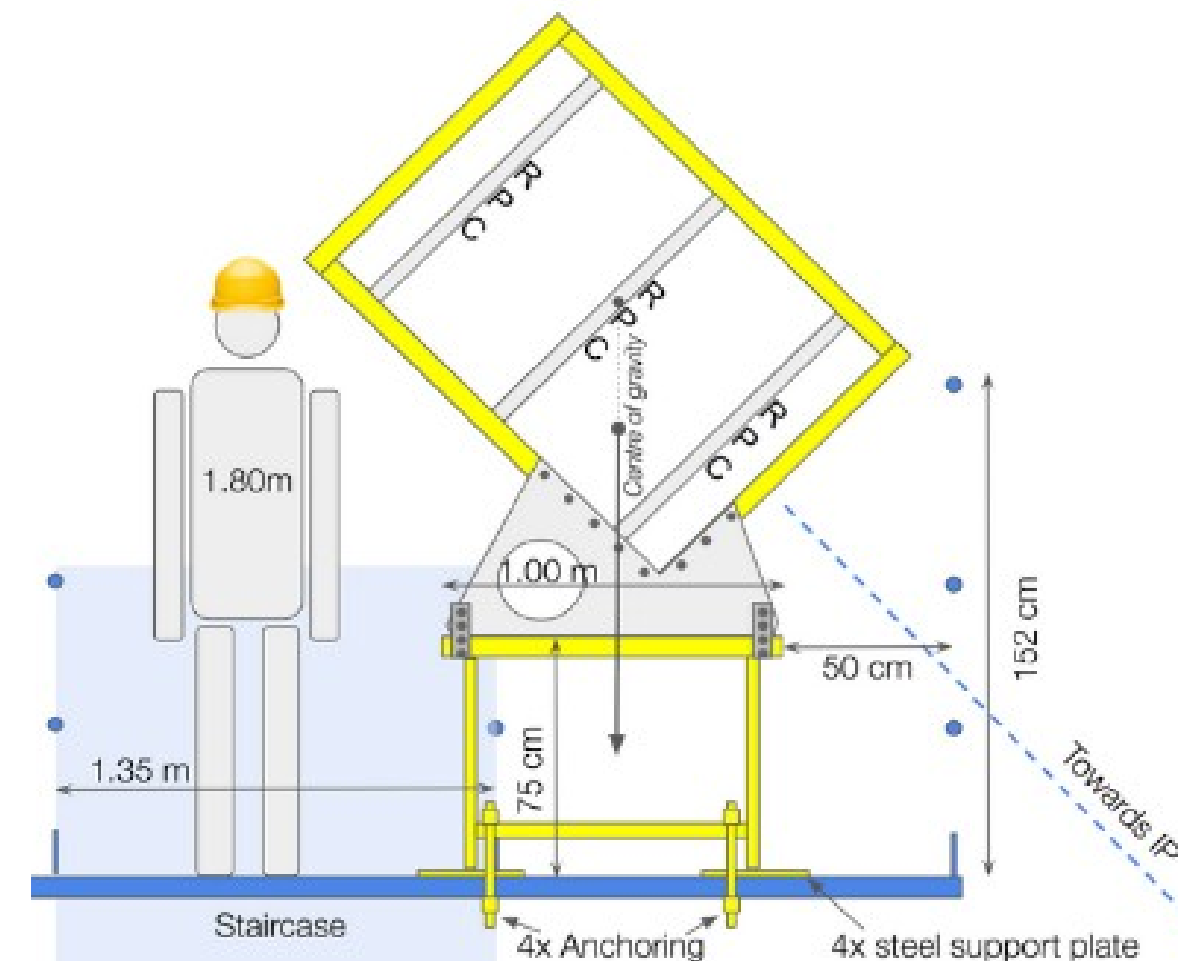
proANUBIS



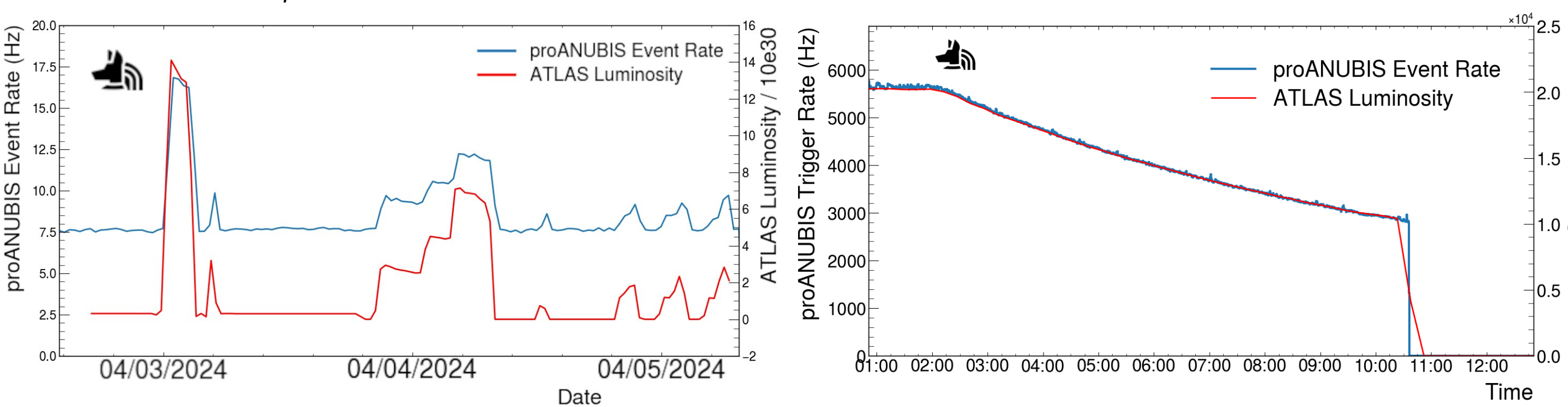
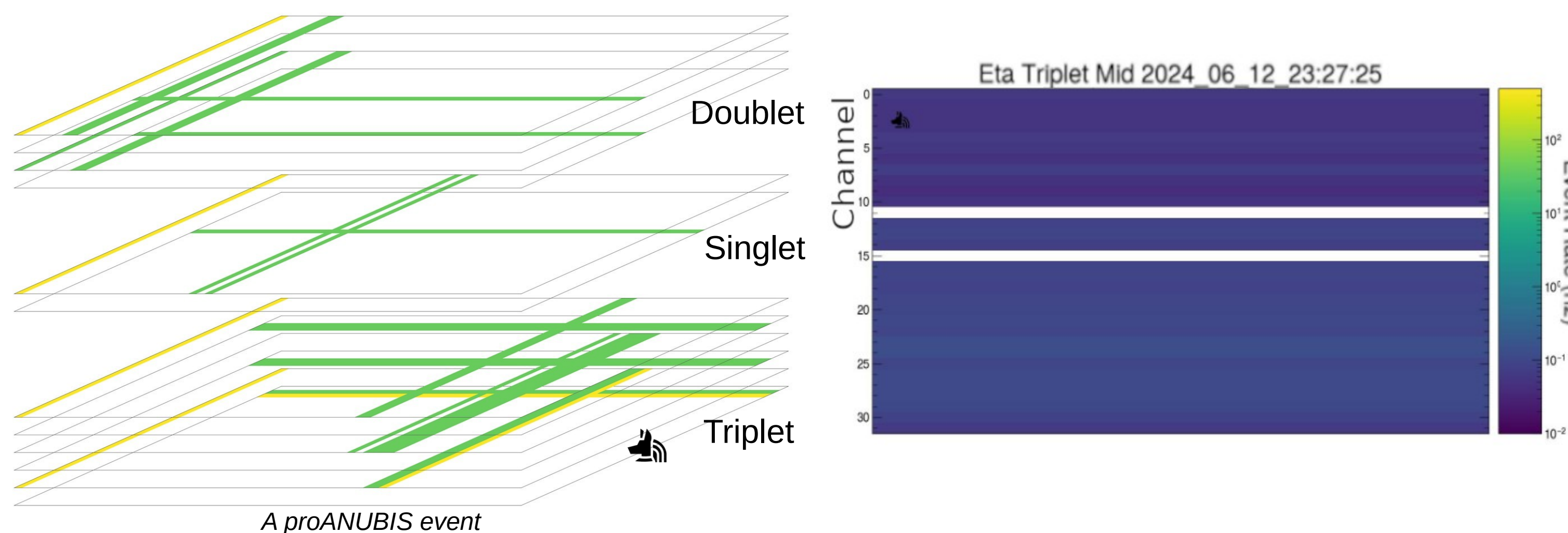
- Single-module prototype installed in ATLAS cavern in 2023.
- Trigger system upgraded in March 2024.

Physics Goals:

- Test detector performance
- Time-align events with ATLAS
- Combined particle reconstruction
- Study punch-through jets
- Validate background predictions

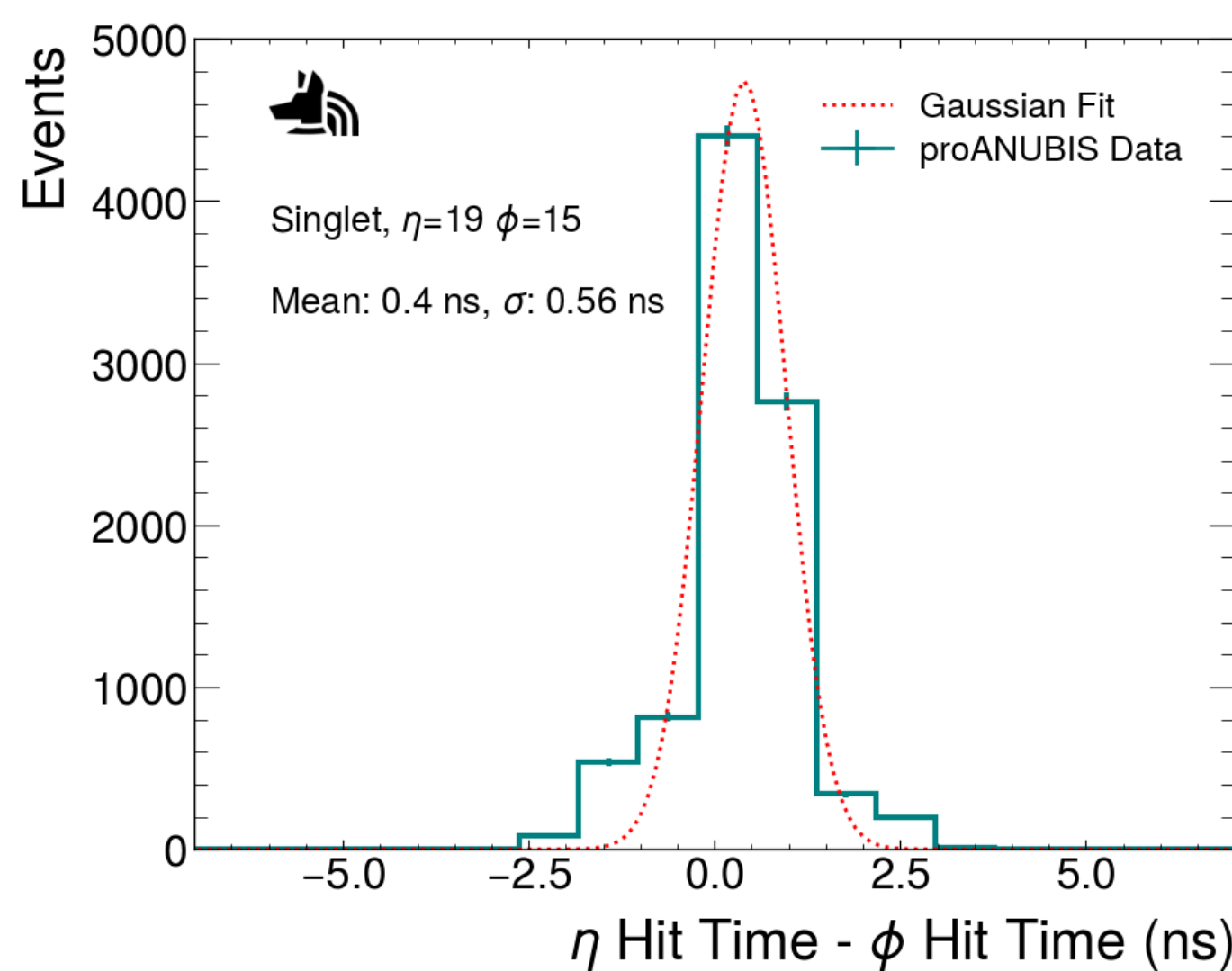
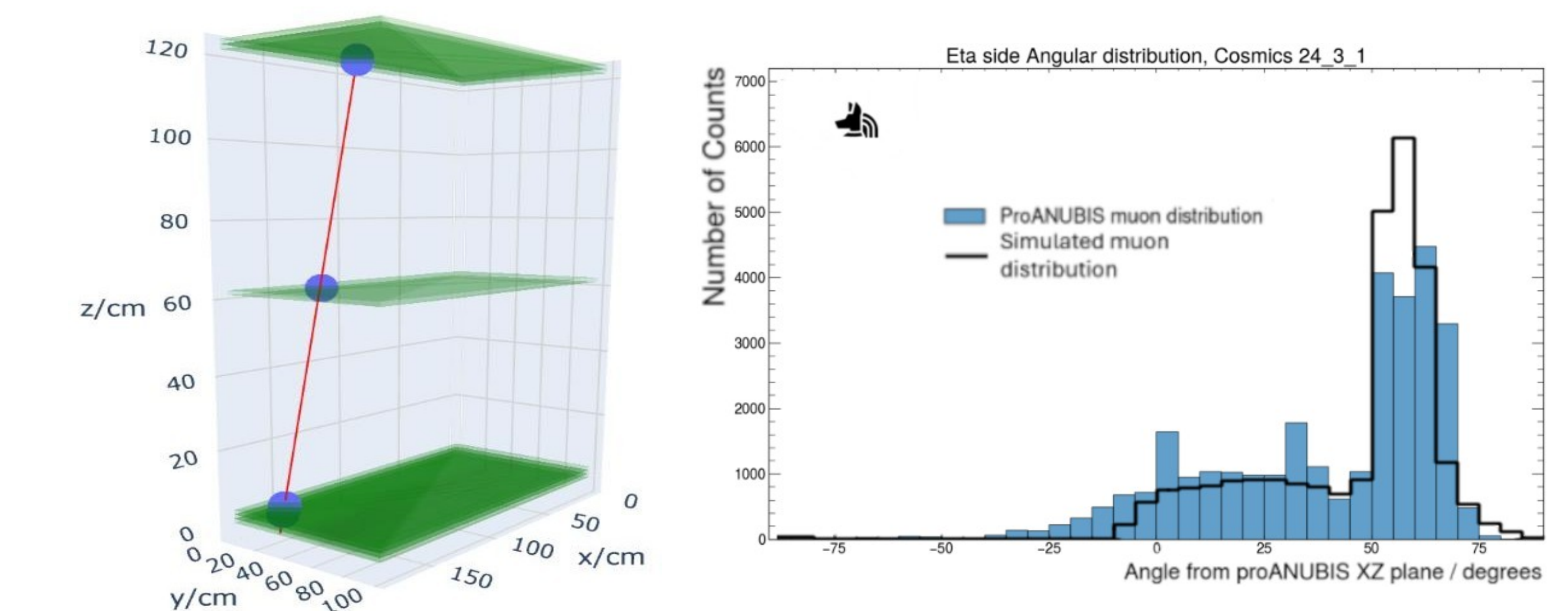


proANUBIS Performance



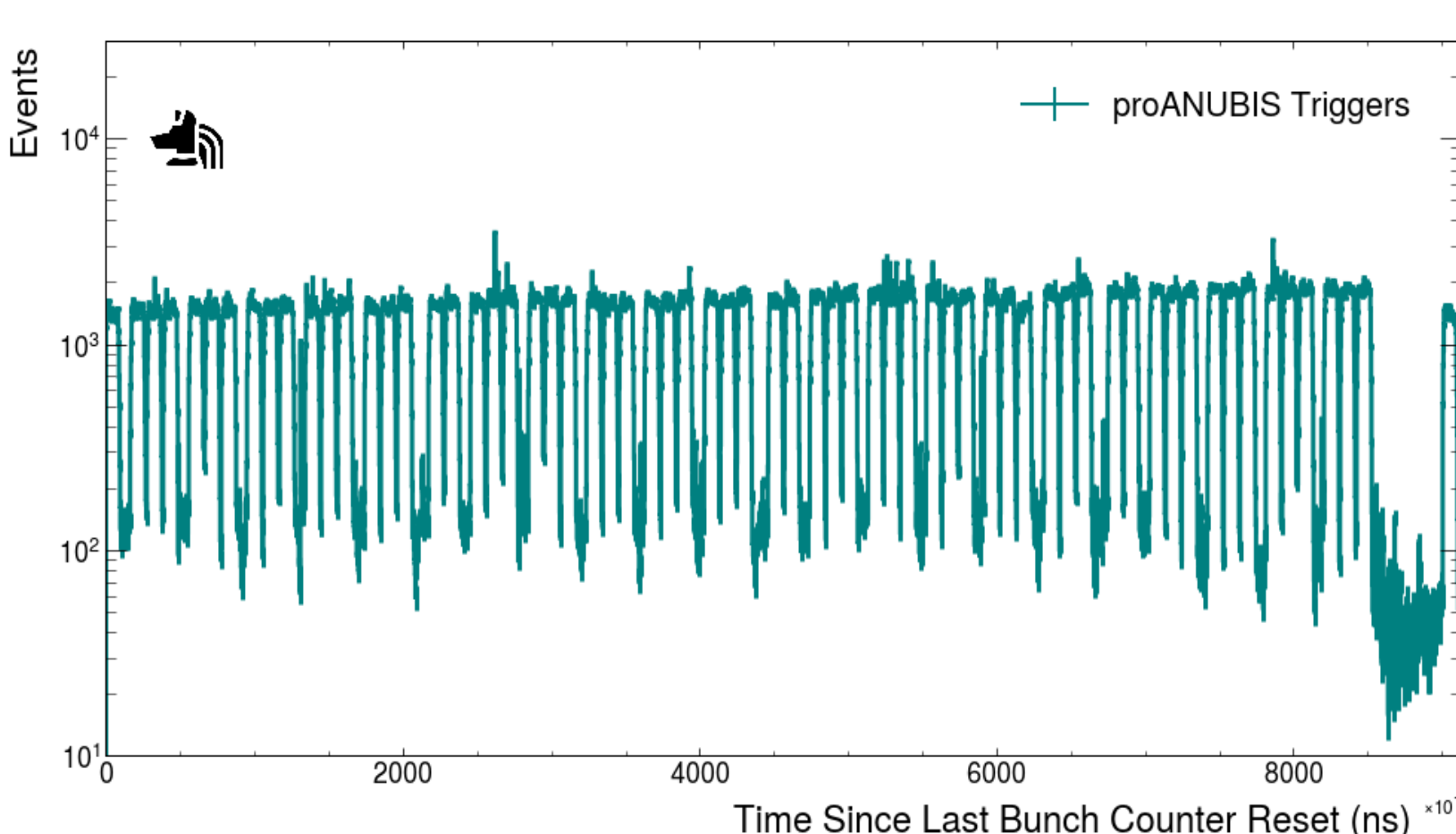
- >99% of RPC strips active.
- Direct correlation between ATLAS lumi and proANUBIS event rate.
- Collected $>23 \text{ fb}^{-1}$ of luminosity.
- > 1TB of data, corresponding to $\sim 10^9$ events.

Analysis



- Developed hit clustering and track finding algorithms.
- Cosmic distribution closely matches simulation.
- Time resolution < 0.8 ns.

Next Steps



- Study RPC efficiency in projected tracks.
- Use trigger timing information to align with ATLAS events.
- Reconstruct muons using both ATLAS and proANUBIS (potentially unique sensitivity to particle β !).
- Study punch-through jets to validate background models.

