

G S I I

p̄ a n d a

FAIR

PandaRoot

PandaRoot



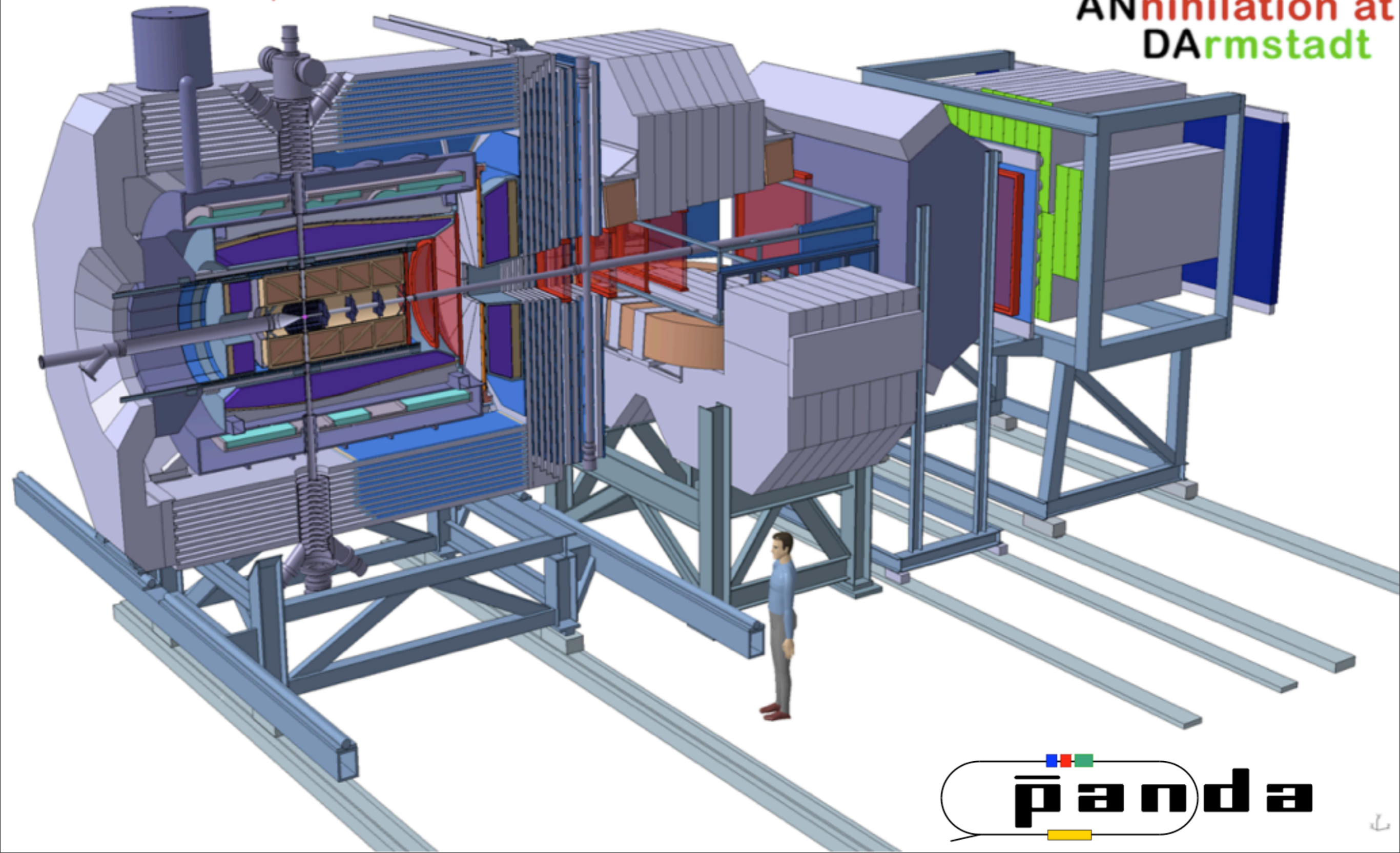
Mohammad Al-Turany
Denis Bertini
Radoslaw Karabowicz
Dmytro Kresan
Florian Uhlig

Panda Experiment

$\bar{p}p, \bar{p}A$ collisions

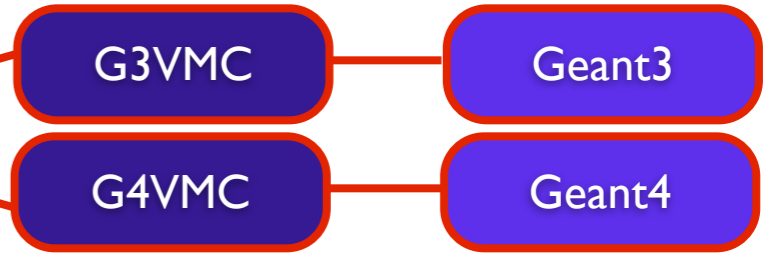
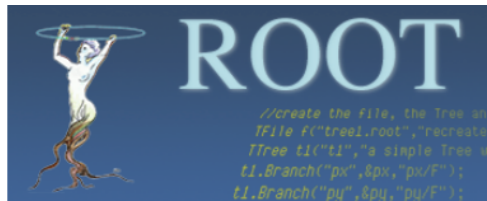
$1.5 \Rightarrow 15 \text{ GeV}/c$ (\bar{p} momentum)

Anti-Proton
ANihilation at
DARMstadt

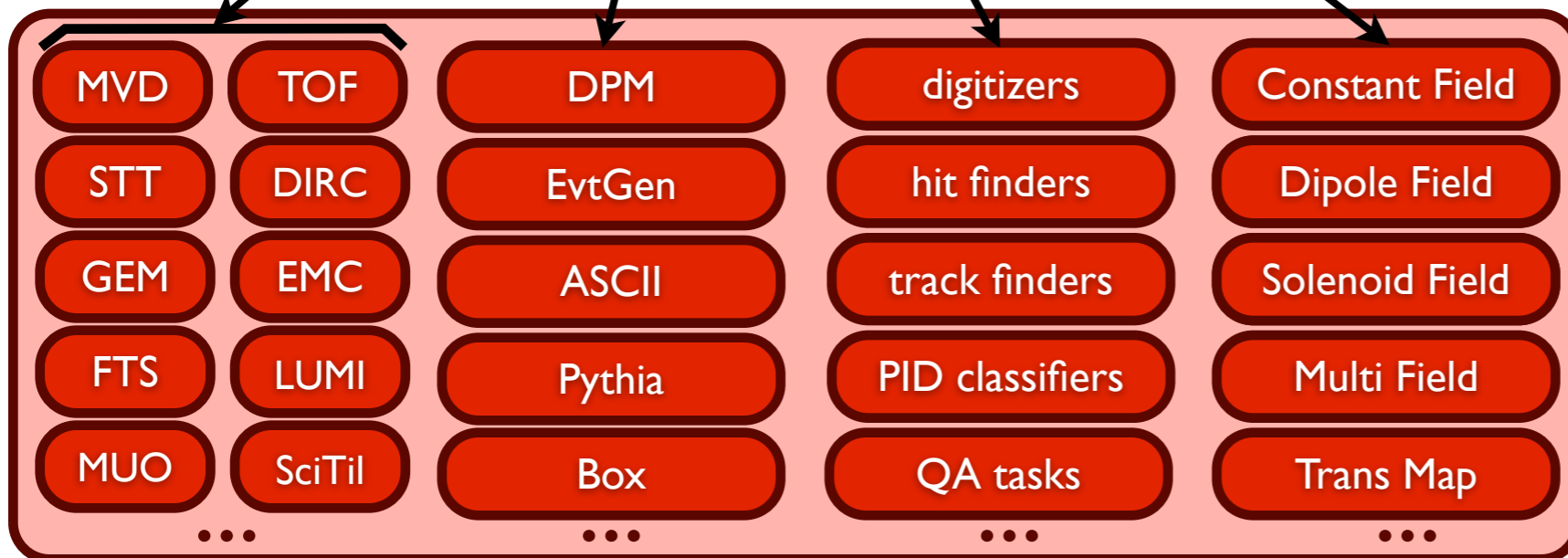
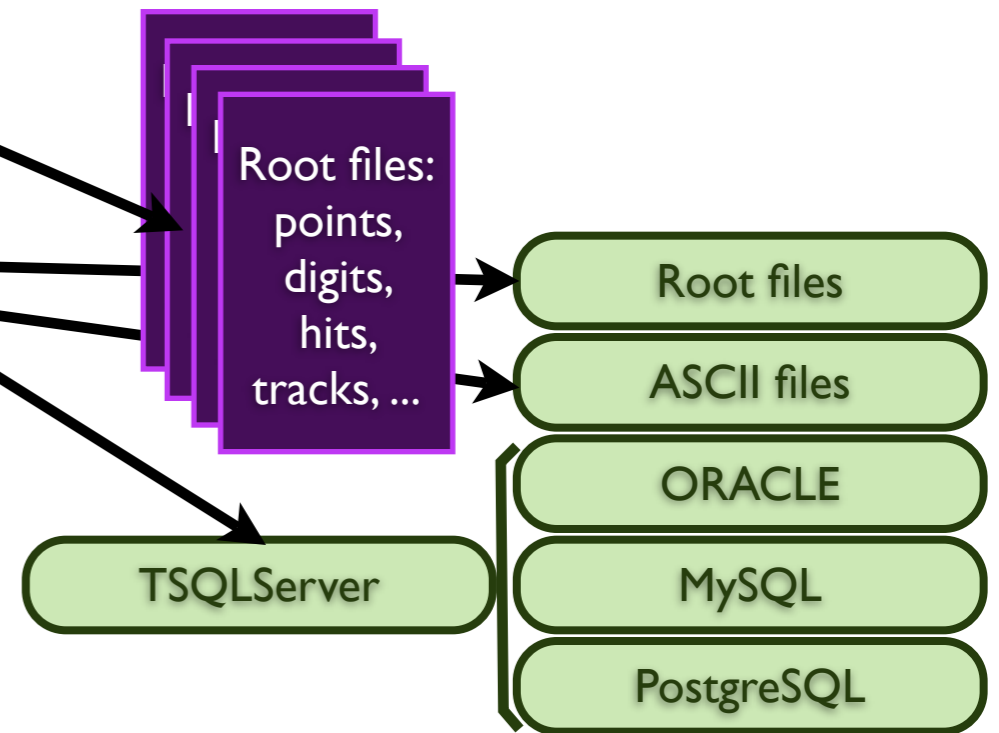
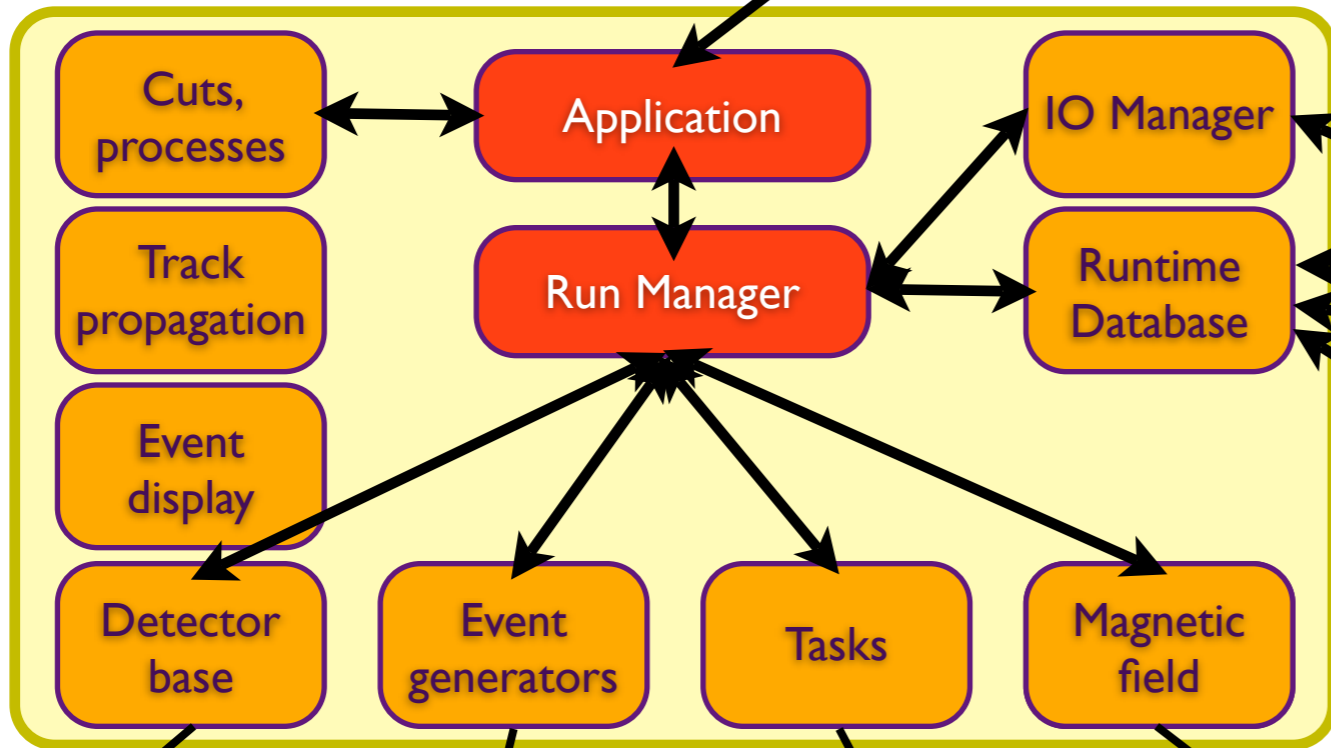


The logo for the Panda experiment, featuring the word "panda" in a stylized, lowercase font. The letter "p" is black, "a" is red, "n" is green, "d" is blue, and "a" is yellow. The logo is enclosed in a white speech bubble-like shape.

Code design



FAIRROOT



PandaRoot



PandaRoot Workpackages

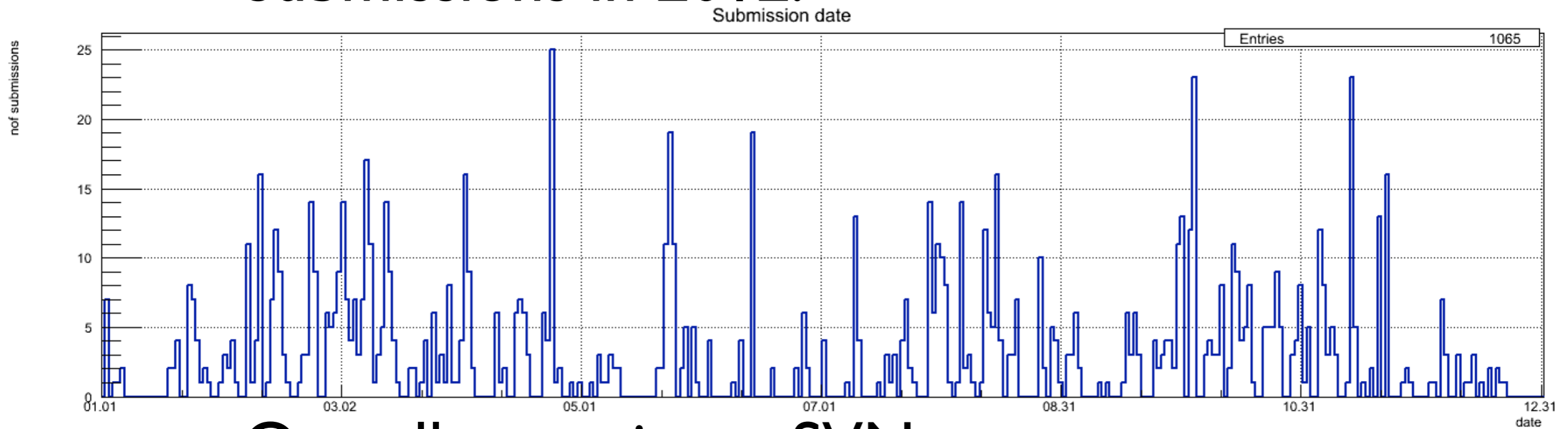
- Individual detectors: MVD, STT, GEM, FTS, TOF, DIRC, MDT, LUMI
- Global Framework
- Global Tracking and Track Fitting
- Global Particle Identification (dE/dx, TOF, Cherenkov, calorimetry, muon ID)
- Analysis Tools (vertex fit, PWA, tutorials, SimpleAnalysisFramework, validation)
- Generators (EvtGen for Panda, Pythia, DPM, Fluka, URQMD, LambdaLambdaBar)
- Service tasks (ReleaseManager, TestFarm)
- GRID and high performance computing

PandaRoot



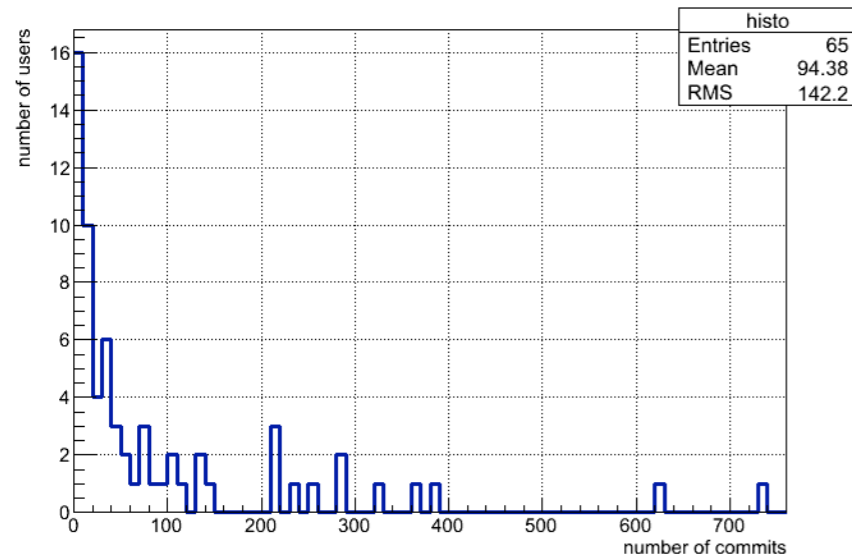
PandaRoot Development

- Submissions in 2012:

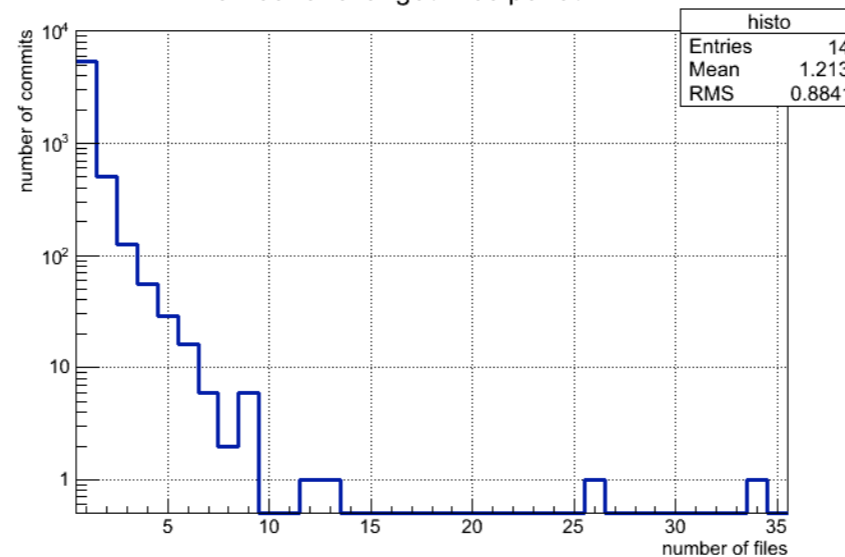


- Overall commits to SVN:

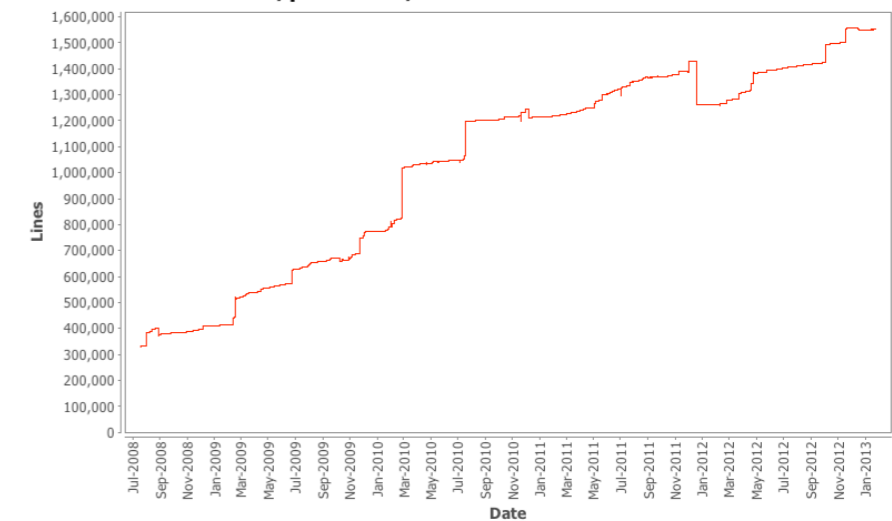
Number of commits to SVN



Number of changed files per commit

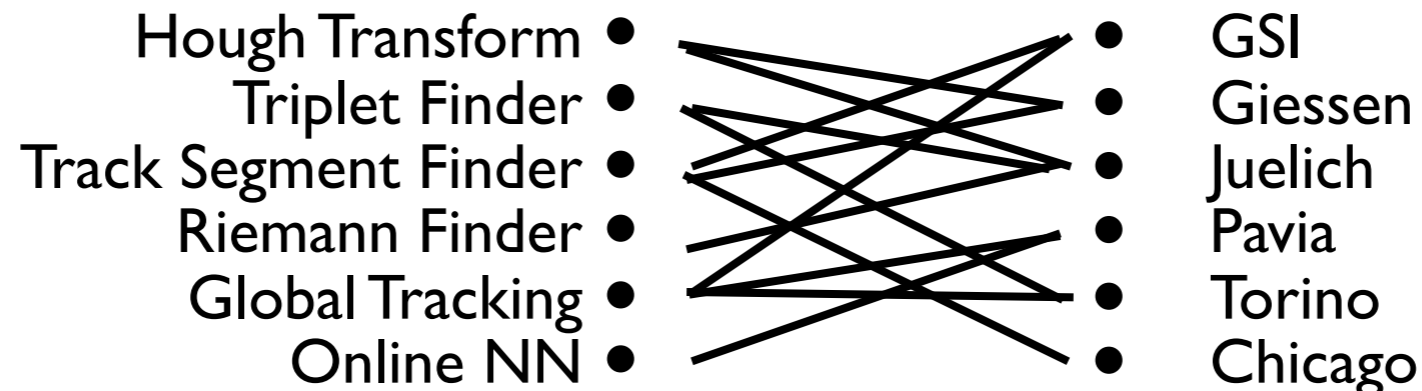


/pandaroot/trunk: Lines of Code



Hottest topics in PandaRoot

- Tracking:



- Particle Identification (in various detectors)

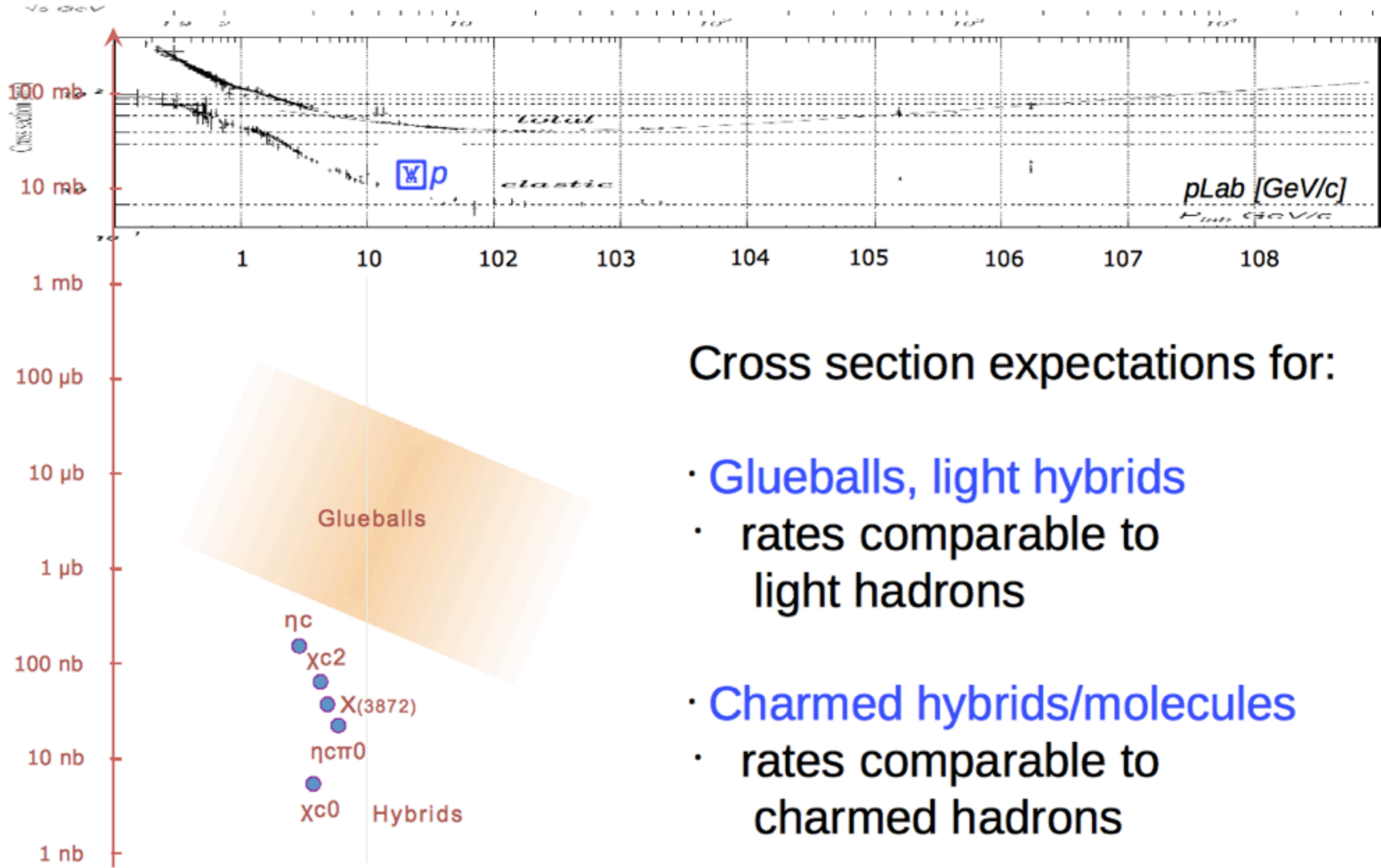
- Physics analysis (many various channels, very low production cross sections)

- Online Event Reconstruction

- Parallel Data Processing (PROOF integrated in FairRoot since Jun 2012)

Thank you for attention

$\mathbb{X}p$ Production Cross Sections



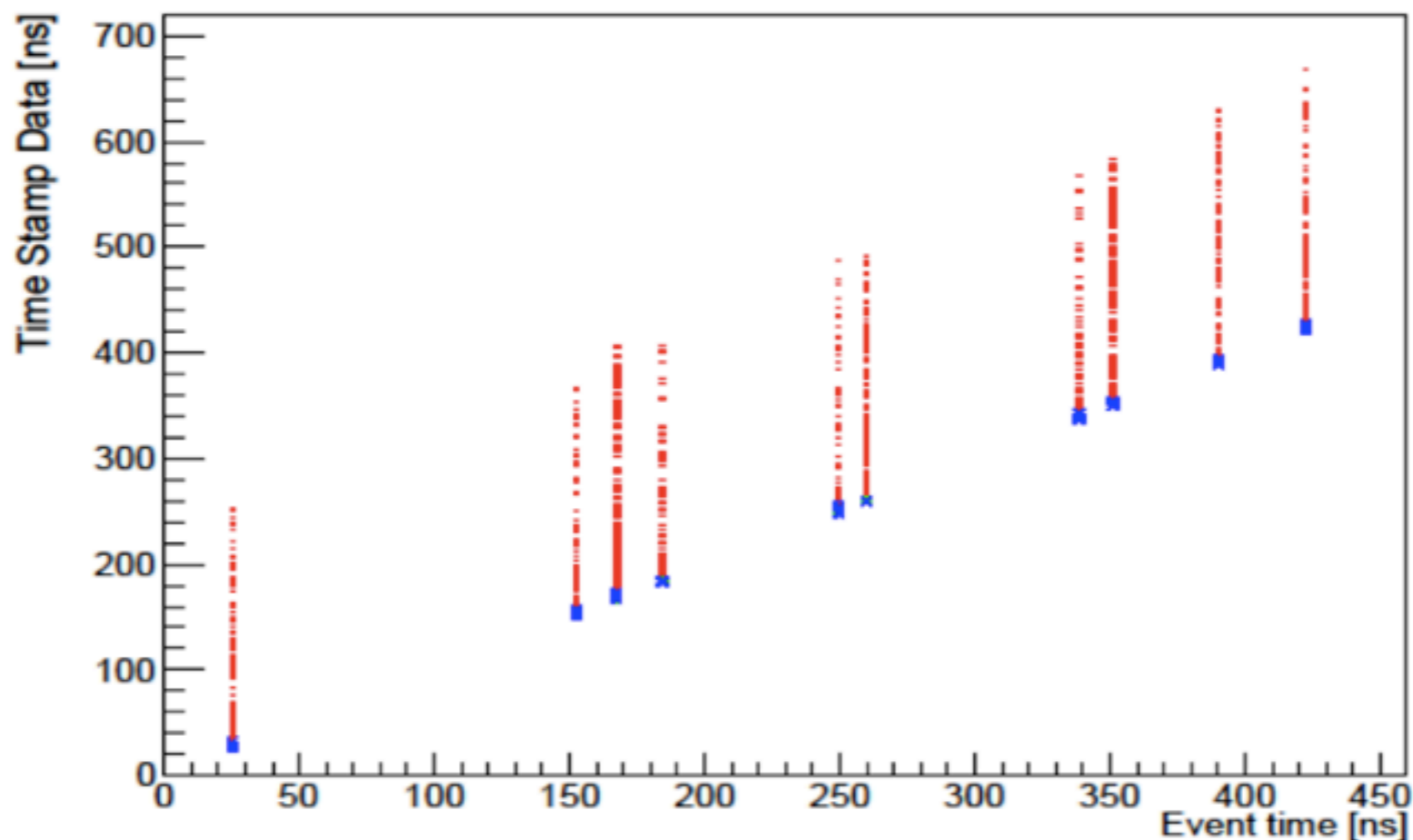
Cross section expectations for:

- **Glueballs, light hybrids**
 - rates comparable to light hadrons
- **Charmed hybrids/molecules**
 - rates comparable to charmed hadrons

Reco & Event Building Challenge

- Time ordered simulation (available within FairROOT)
- Strong overlap in time of hits from sequent events
- Need robust/fast reco to get disentangled by event building

STTHit.fTimeStamp:EventHeader.fEventTime



Continuous Online Tracking: Motivation/Concept

- Similar topology of signal and background
 - No simple criteria with high suppression potential
- Quasi-continuous high-rate operation of PANDA
 - Overlapping events, stateless pattern recognition started upon simple criteria may process redundant time windows
- Most channel selections require tracking information

- Data parallelism
- Dedicated algorithms optimized for different topologies
- Defined start conditions after barrier bucket gap