BigCal energy calibration with π^0

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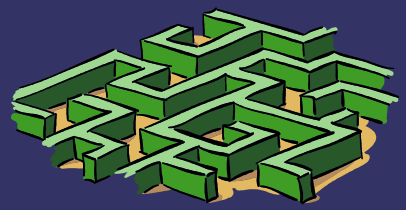
Aug. 15, 2008

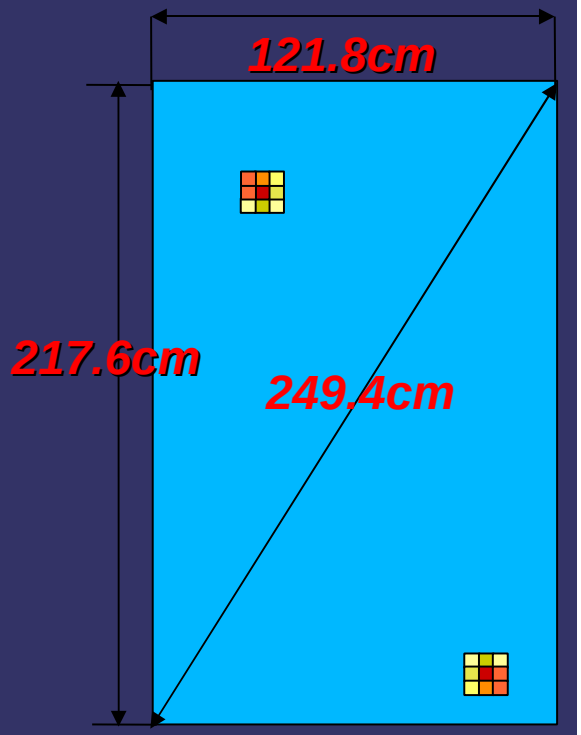
Outline

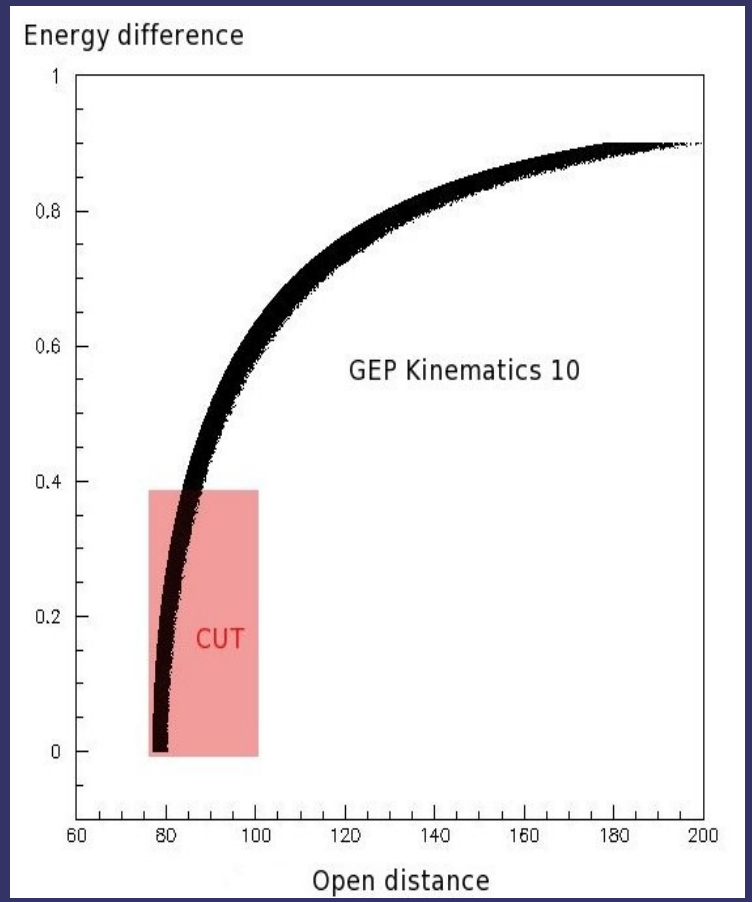
- Calibration procedure
- Calibration result
- Summary

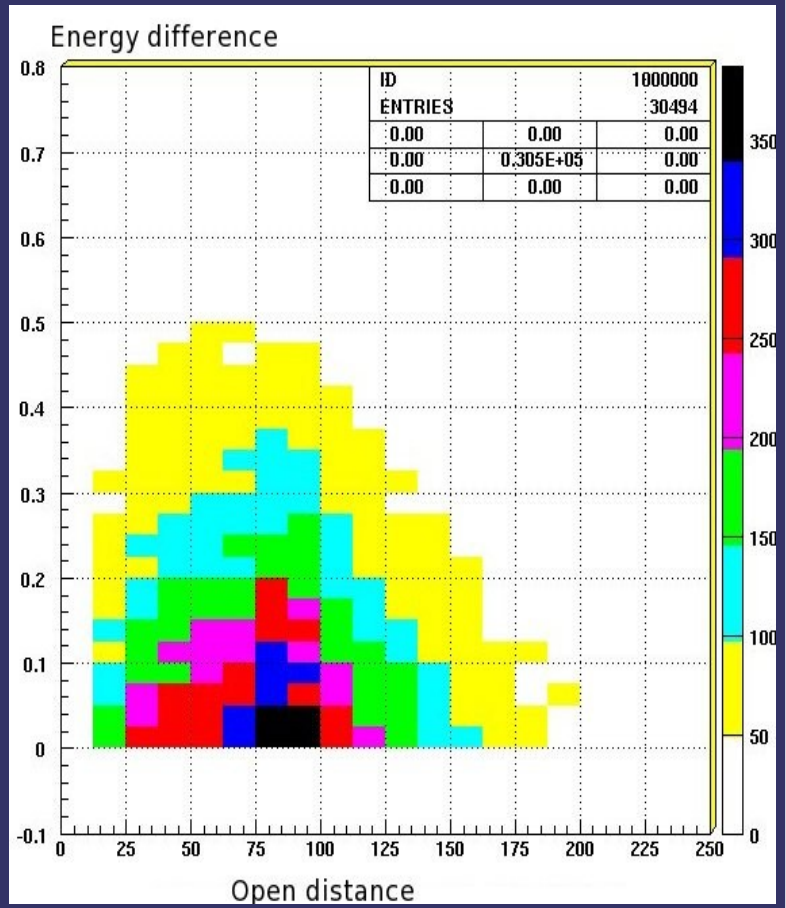


Calibration procedure

- π^0 event selection
- Simulation of π^0 decay
- --In GEP3 coin trigger, most of π^0 come from $\gamma+p\rightarrow \pi^0+p$ reaction
- calculate π^0 decay with this momentum
- reconstruct π^0 mass with $M_0=\sqrt{2E_1E_2(1-\cos\theta_{12})}$



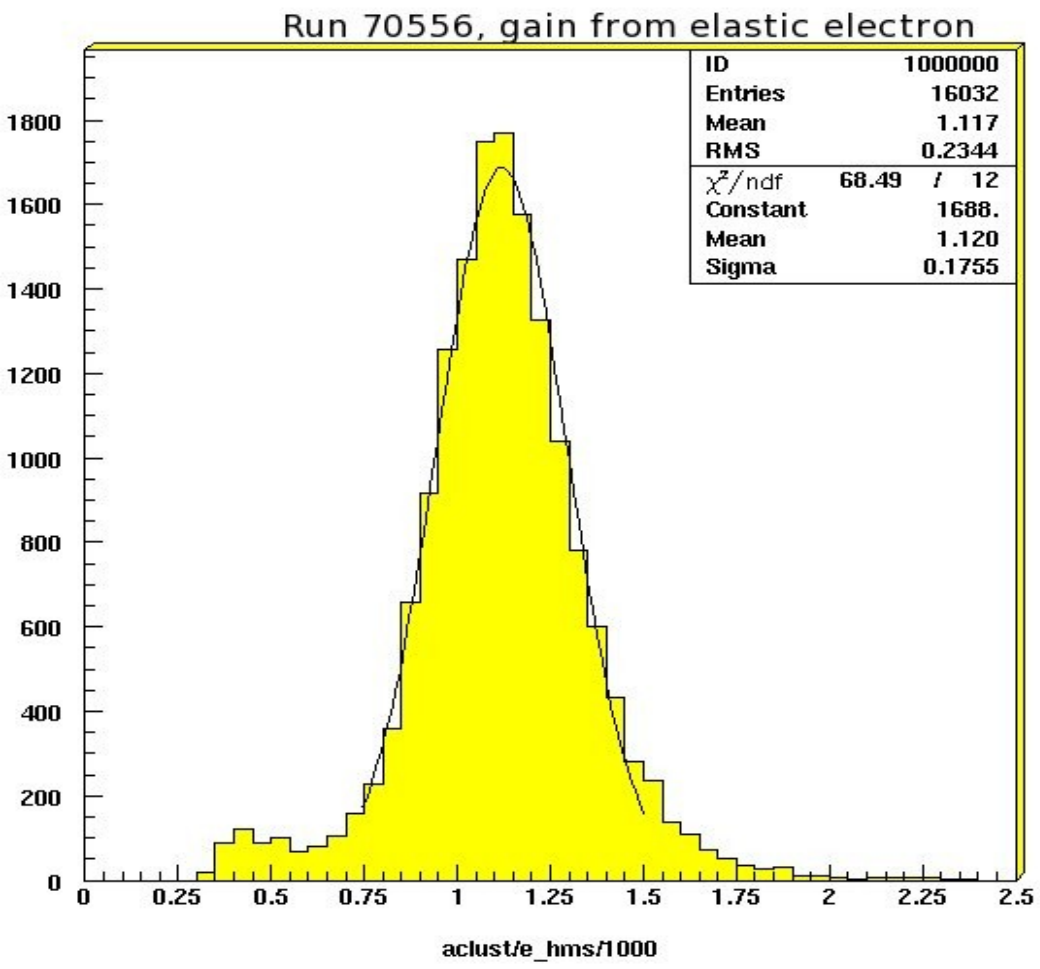


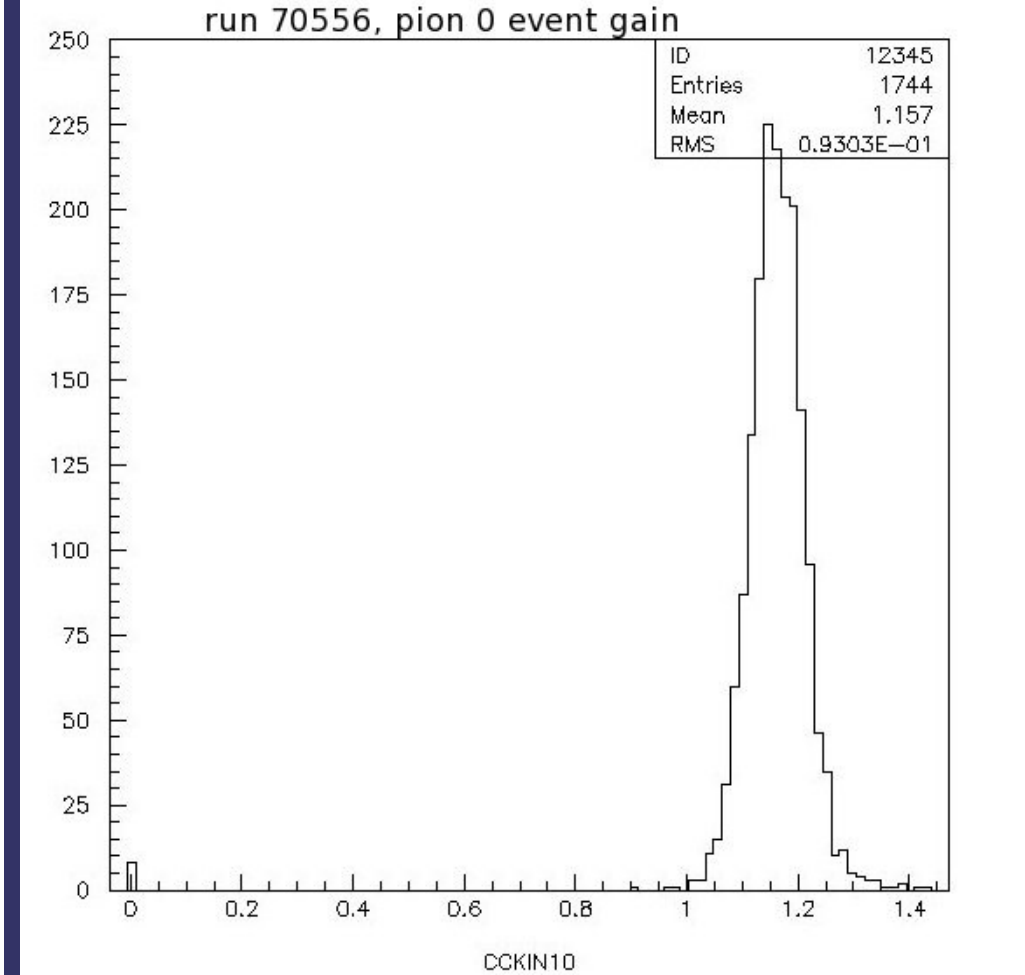


Calibration result

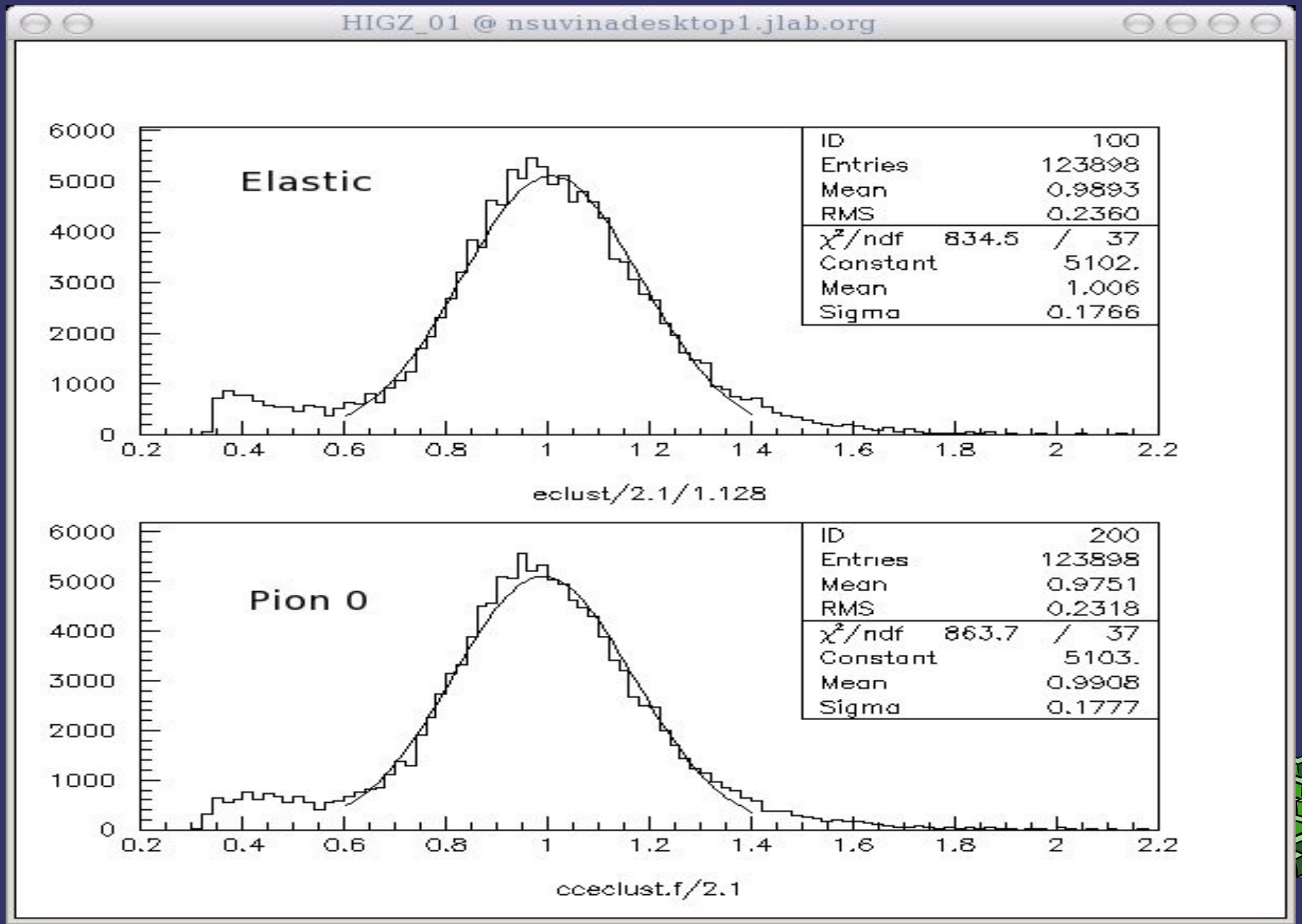
- A result from GEP3 Kinematics 10.
- R_{bigCal}=6.0m θ_{BigCal}=44.4˚ $E_{elastic}$=2.1GeV

Gain of π^0 and elastic electron:



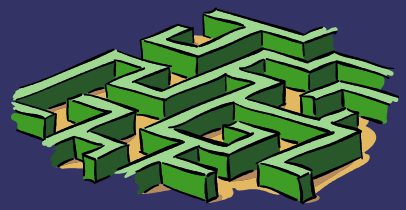


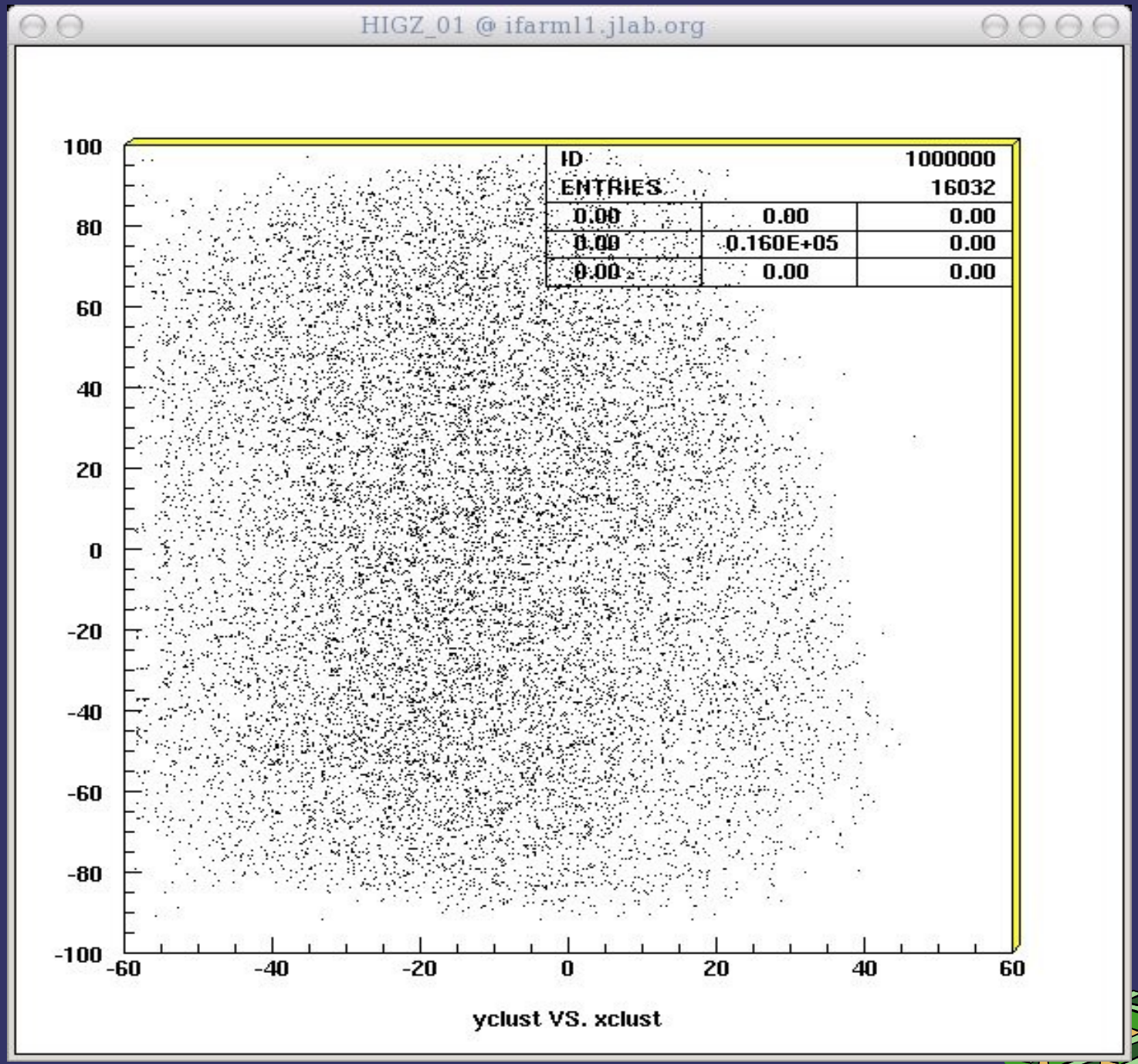
Elastic events after applying π^0 calibration constant



Summary

1. π^0 can be used to do calibration for some kinematics of GEP3.
   At high Q2 point, it's rate is higher than elastics, and can cover the whole BigCal.
2. The calibration result from elastic electron calibration is consistent with result from π^0

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yclust VS. xclust