

Test results and status on T0

T0: start counter for pp collisions

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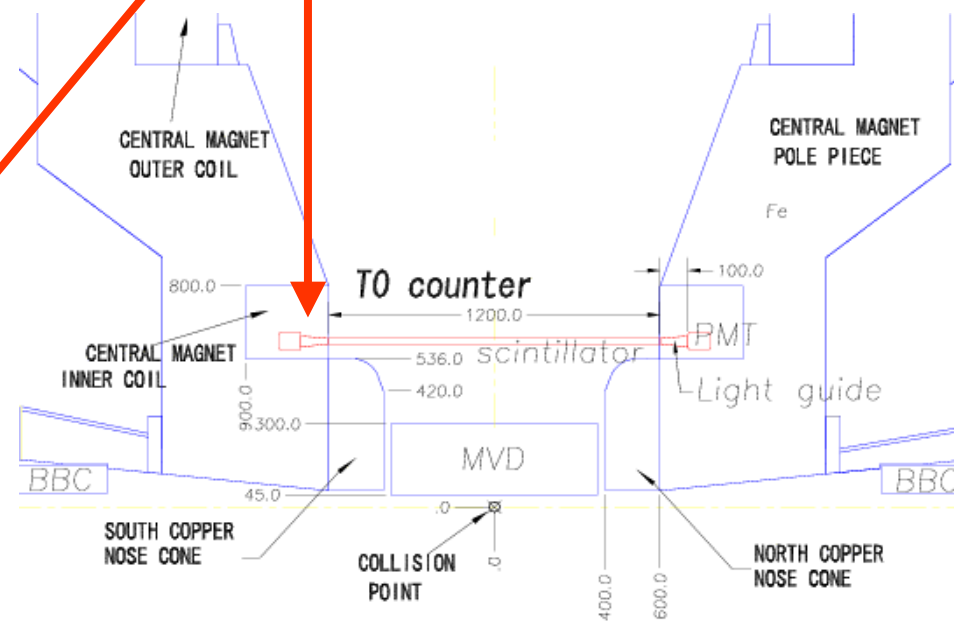
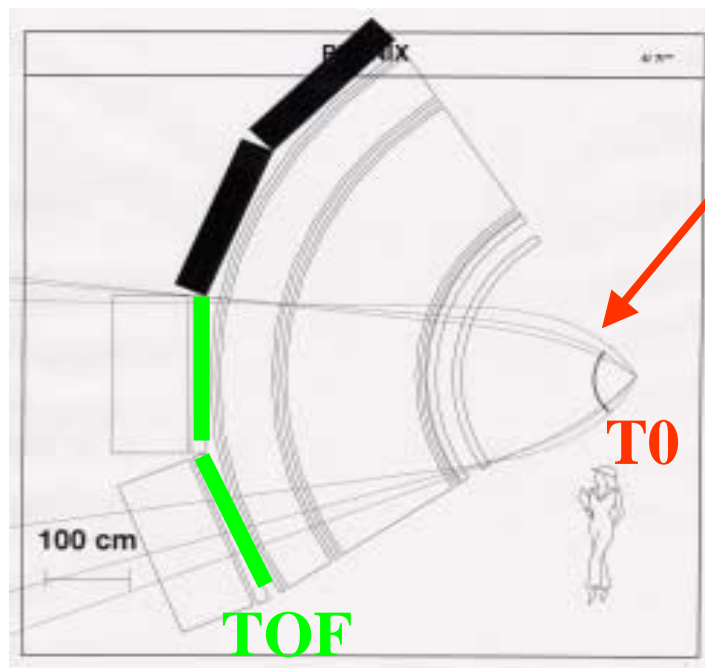
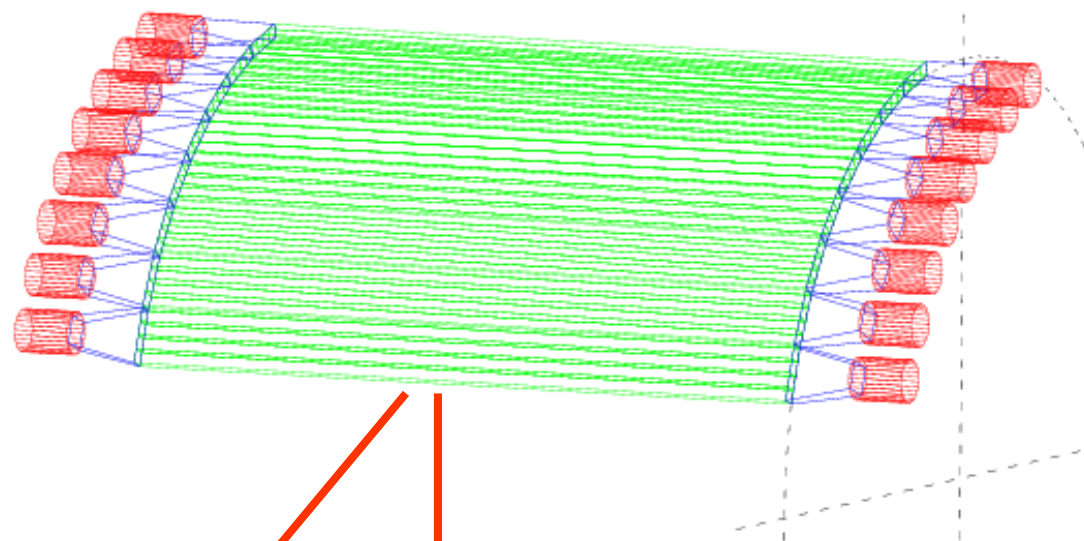
test experiment at KEK-PS

analysis results and simulations

photon conversion rejection

Summary, open questions and plan

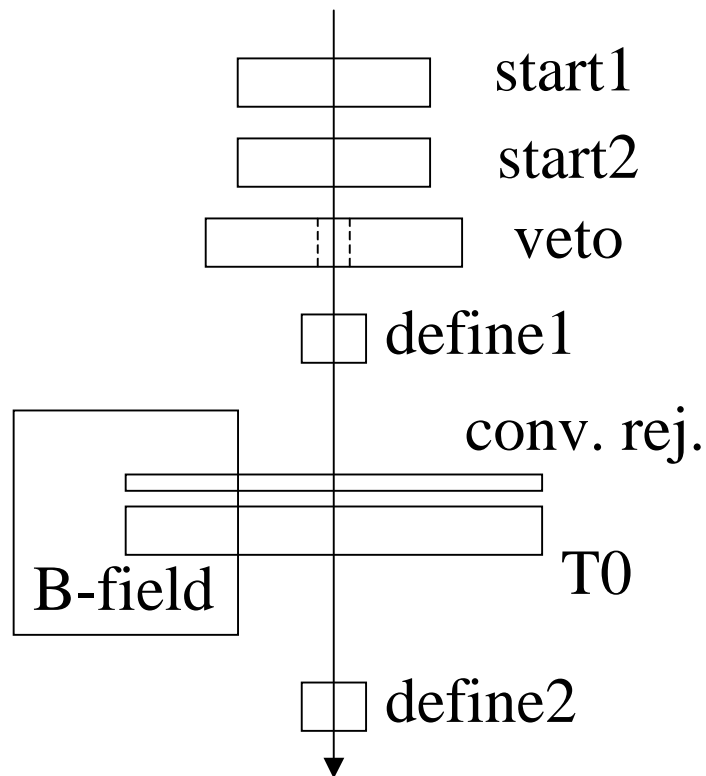
Proposed T0 in PHENIX



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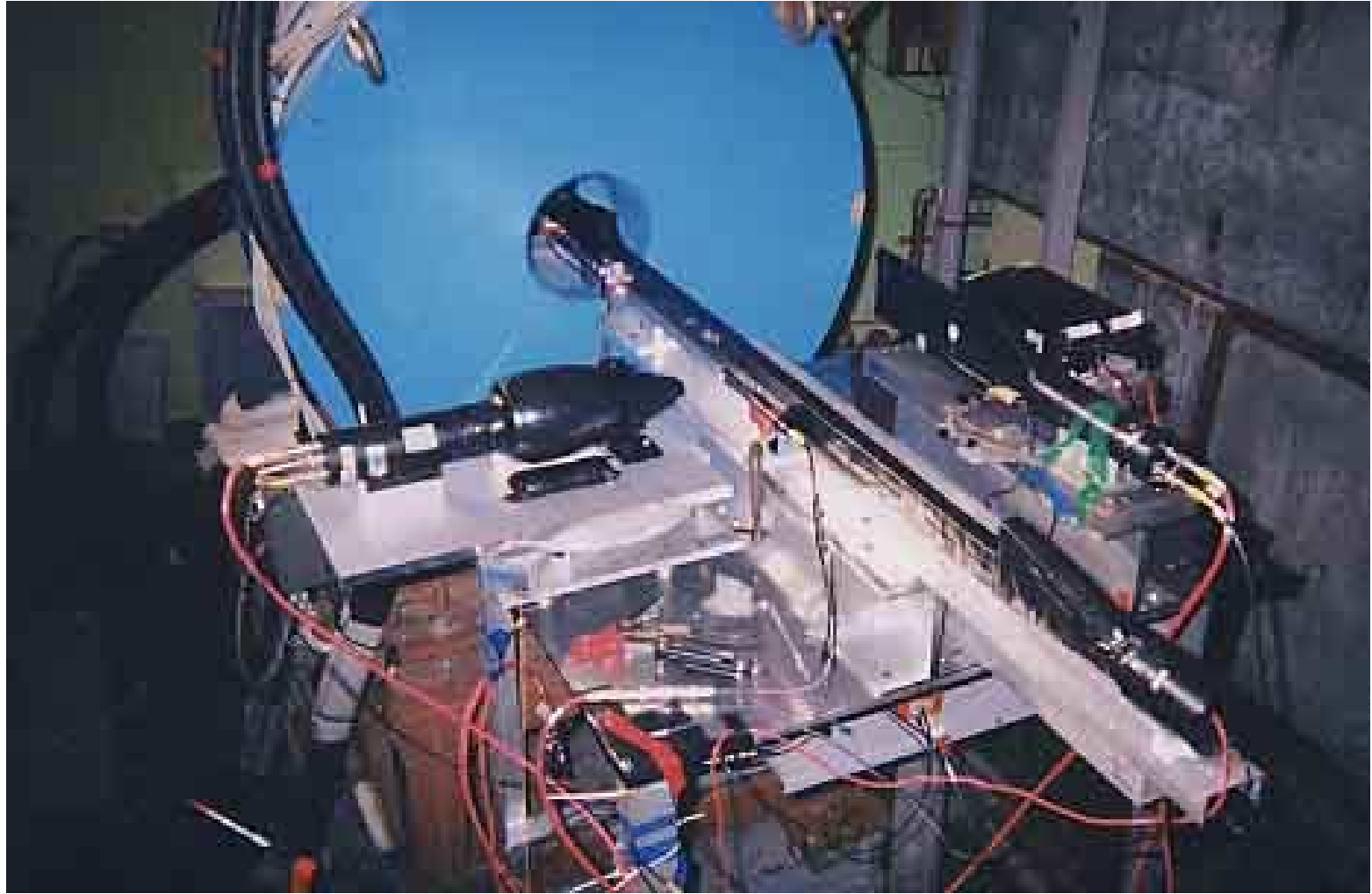
Test experiment at KEK-PS

2GeV/c pi- beam



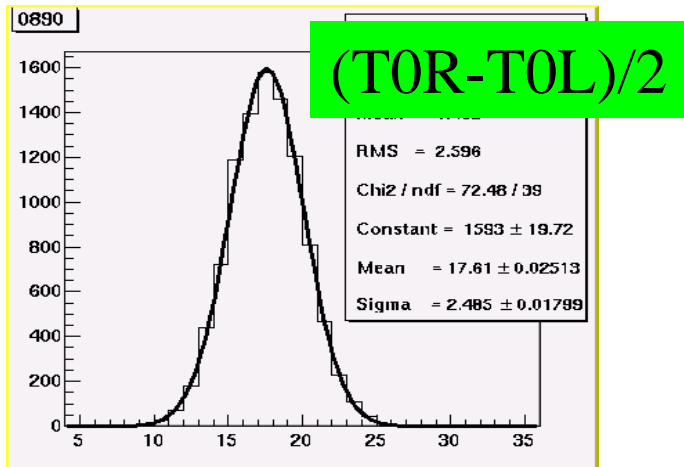
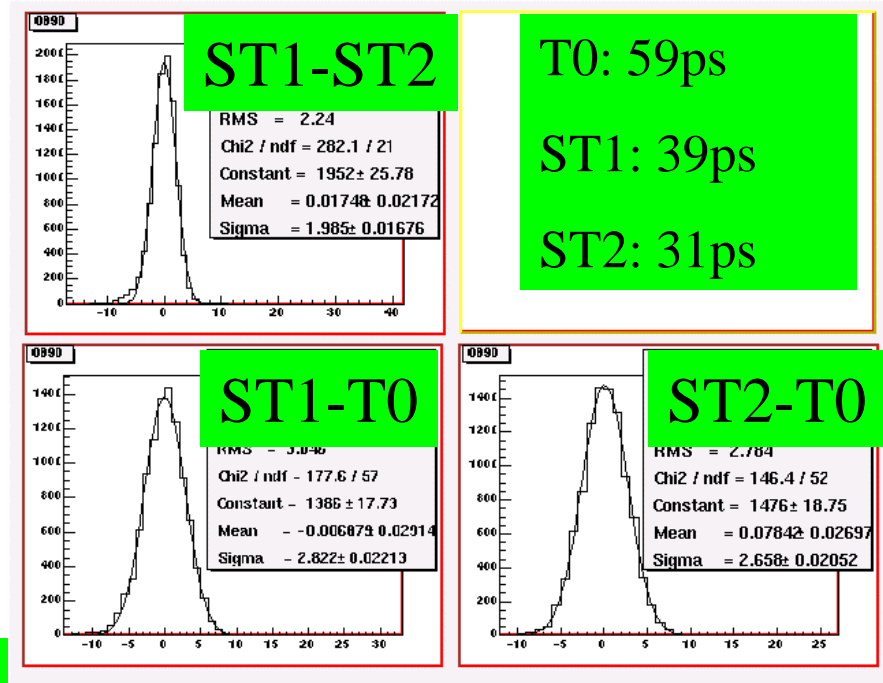
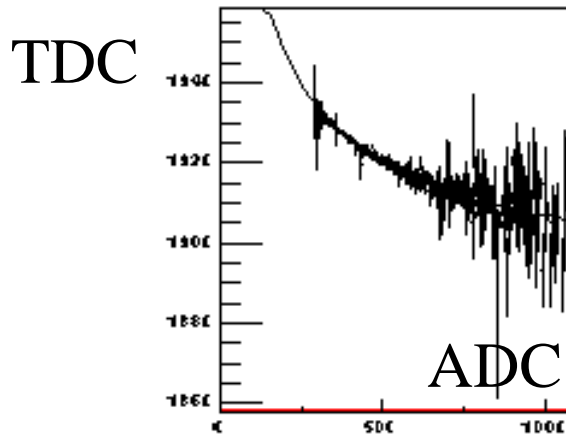
- time resolution
- position dep.
- thickness dep.
- width dep.
- light guide
- B-field dep.

Fine mesh PMT:
Hamamatsu 2inch R5924



Time resolution

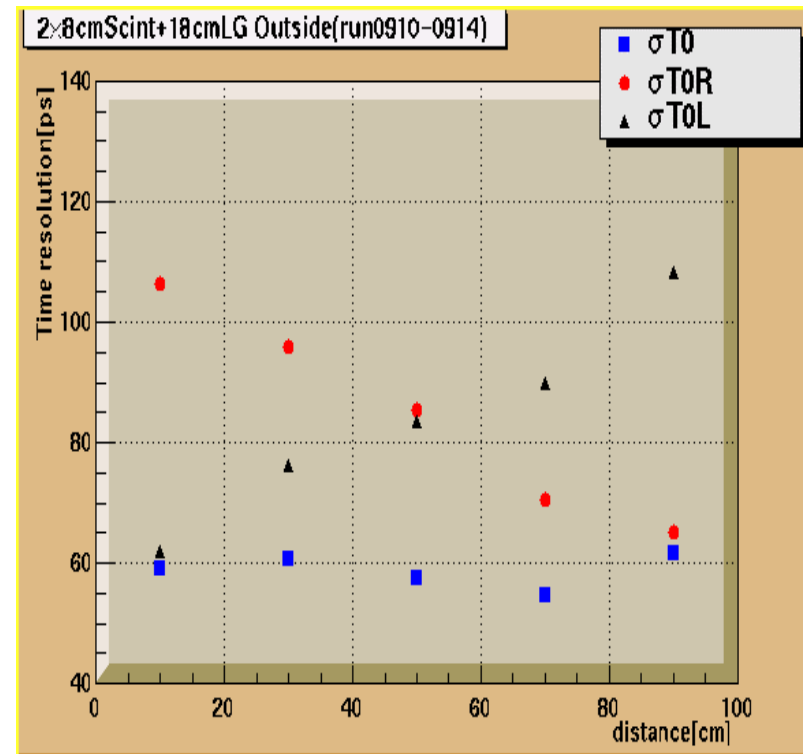
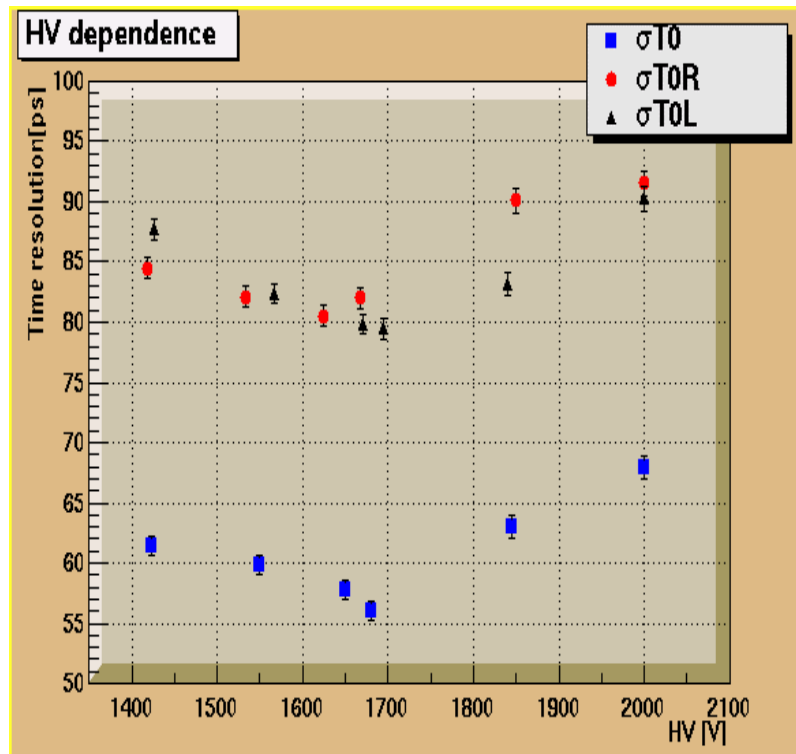
Slewing correction



beam width (def. size) :
 $1[\text{cm}]/15[\text{cm/ns}]/\text{sqrt}(12) \sim 20\text{ps}$

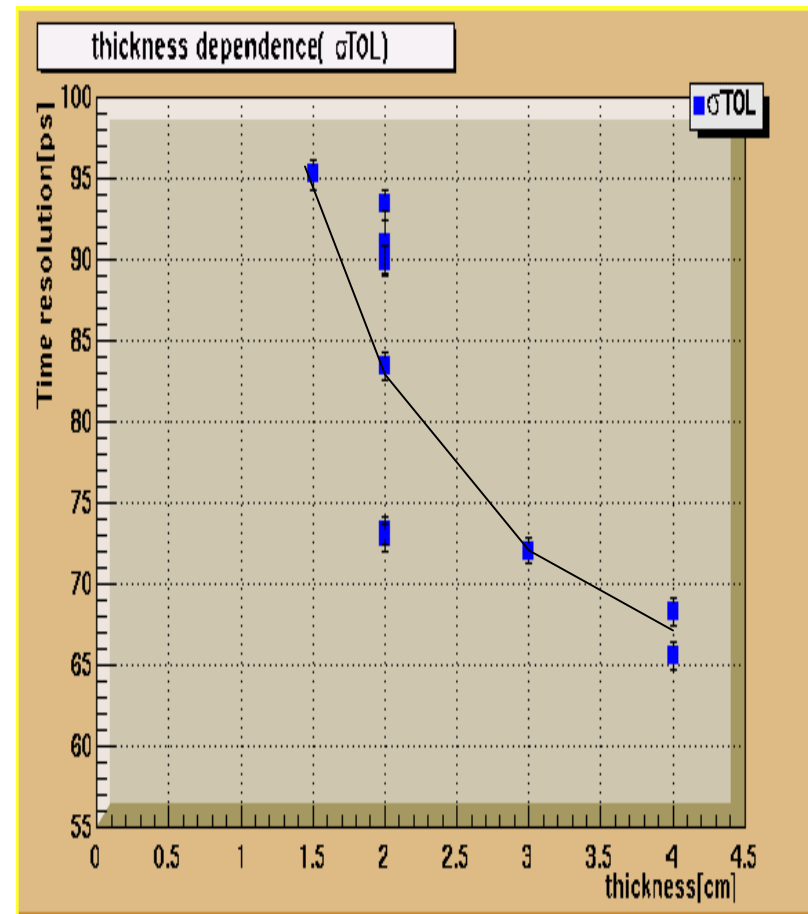
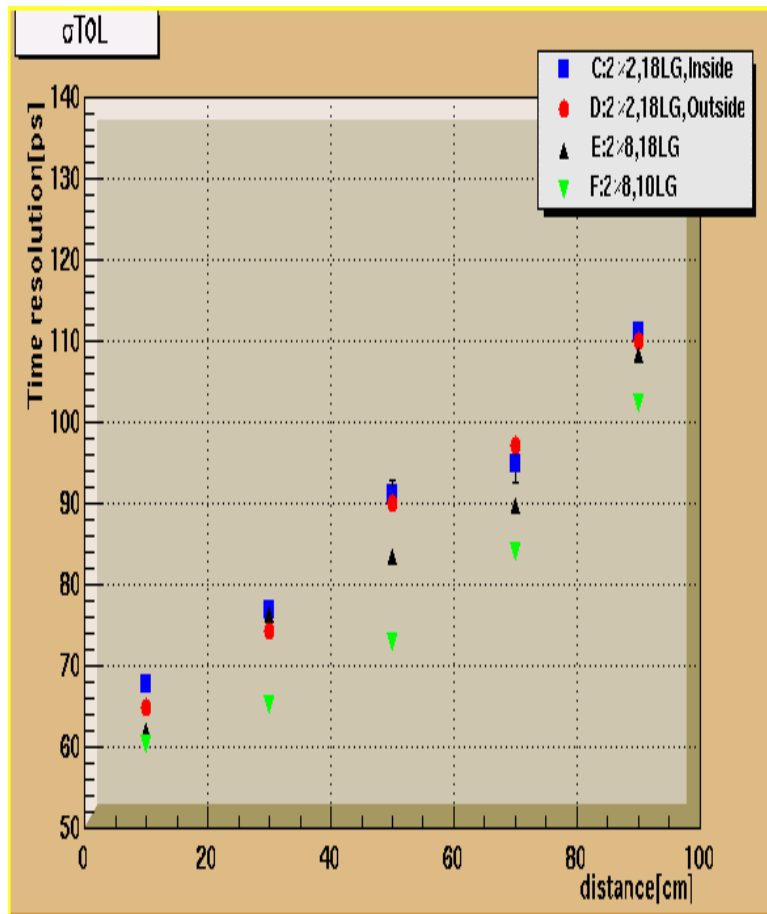
$\sigma(T0) \sim 59\text{ps}$

HV/position dependence

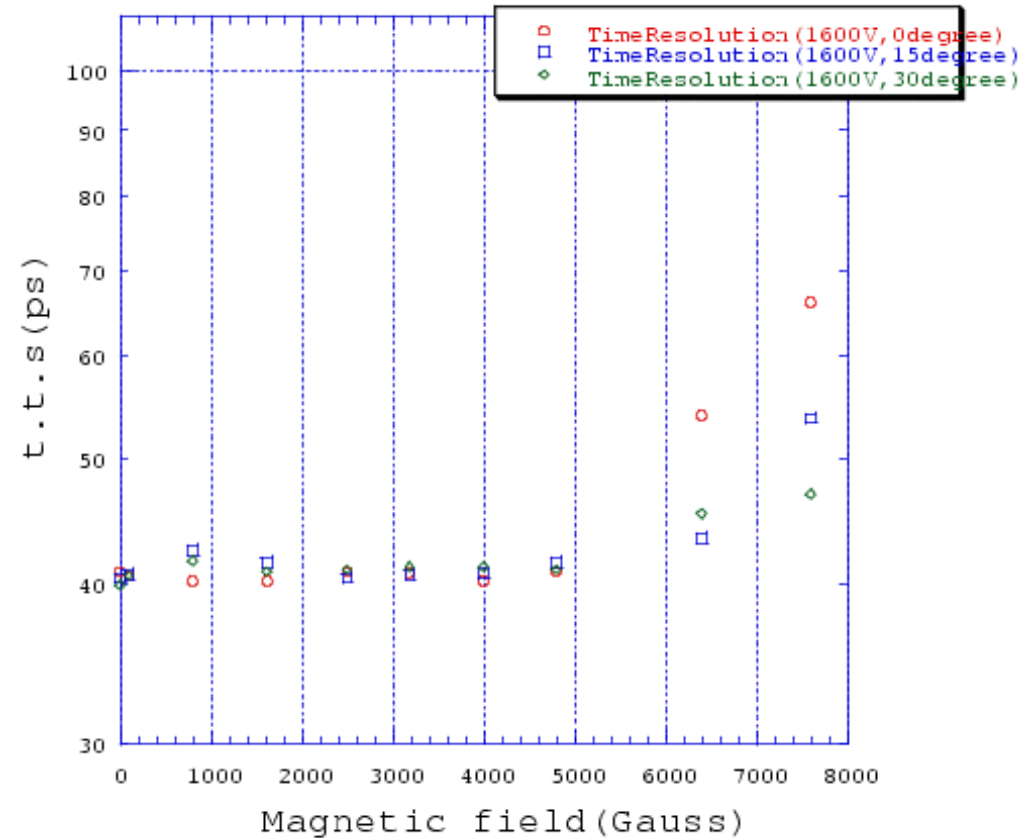
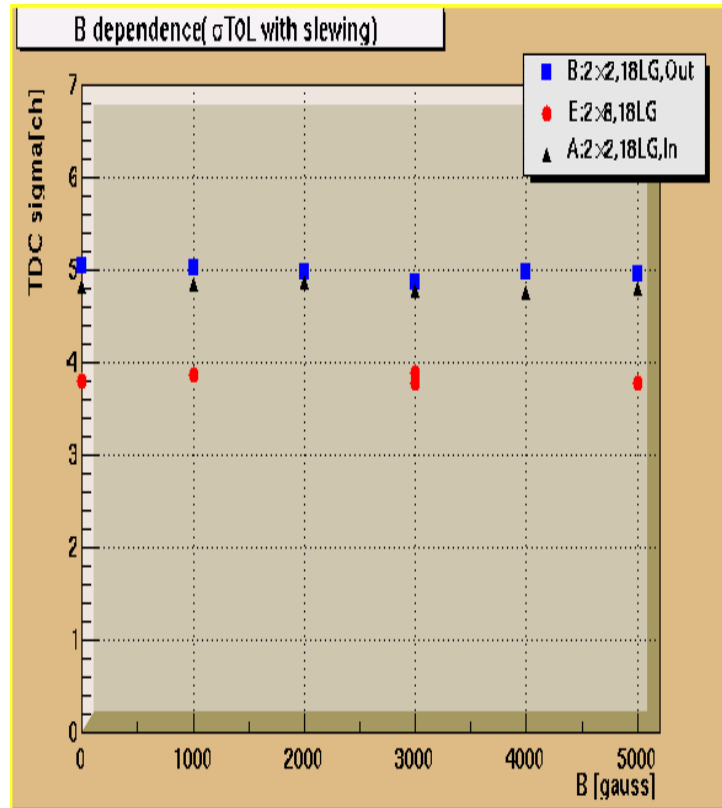


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Thickness/width/light guide dependence



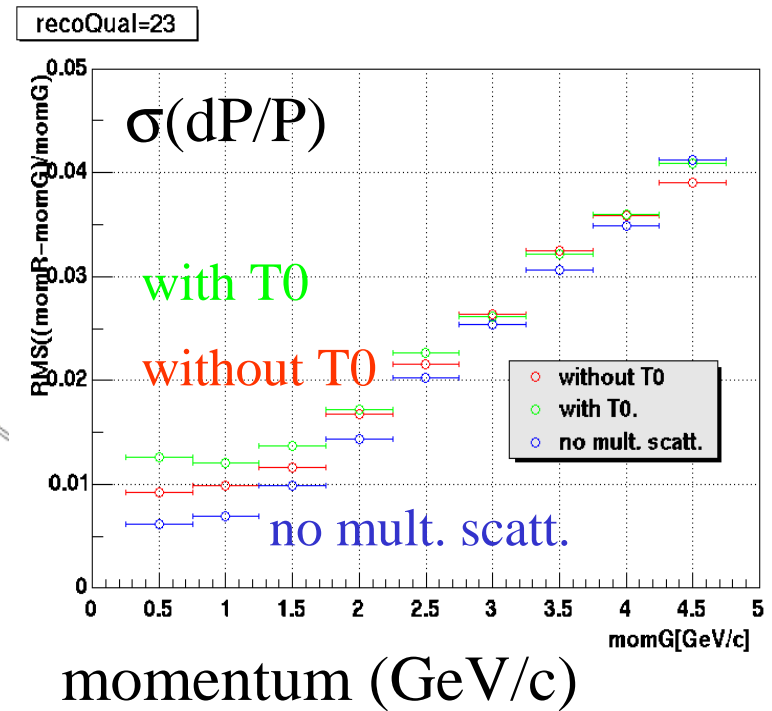
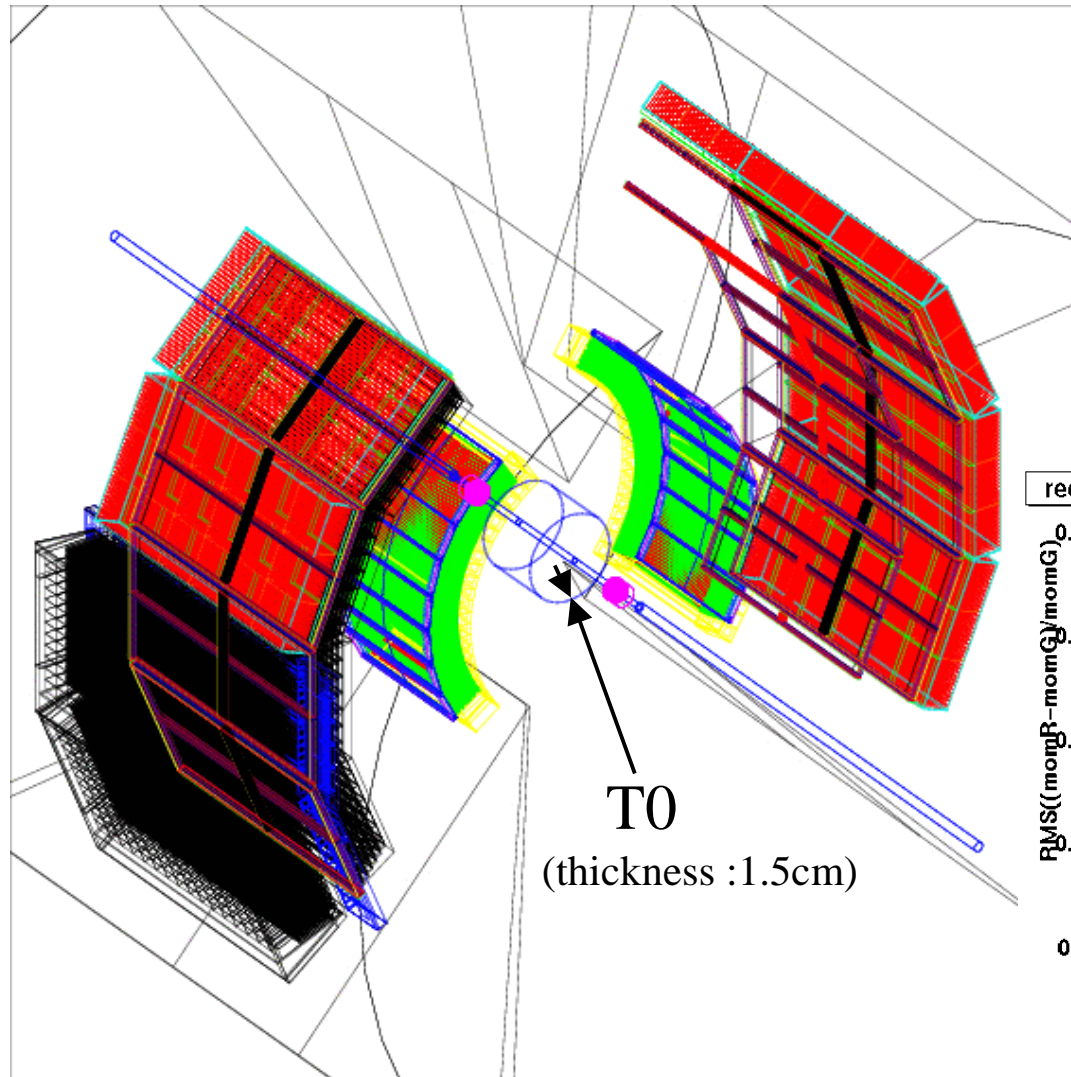
B-field dependence



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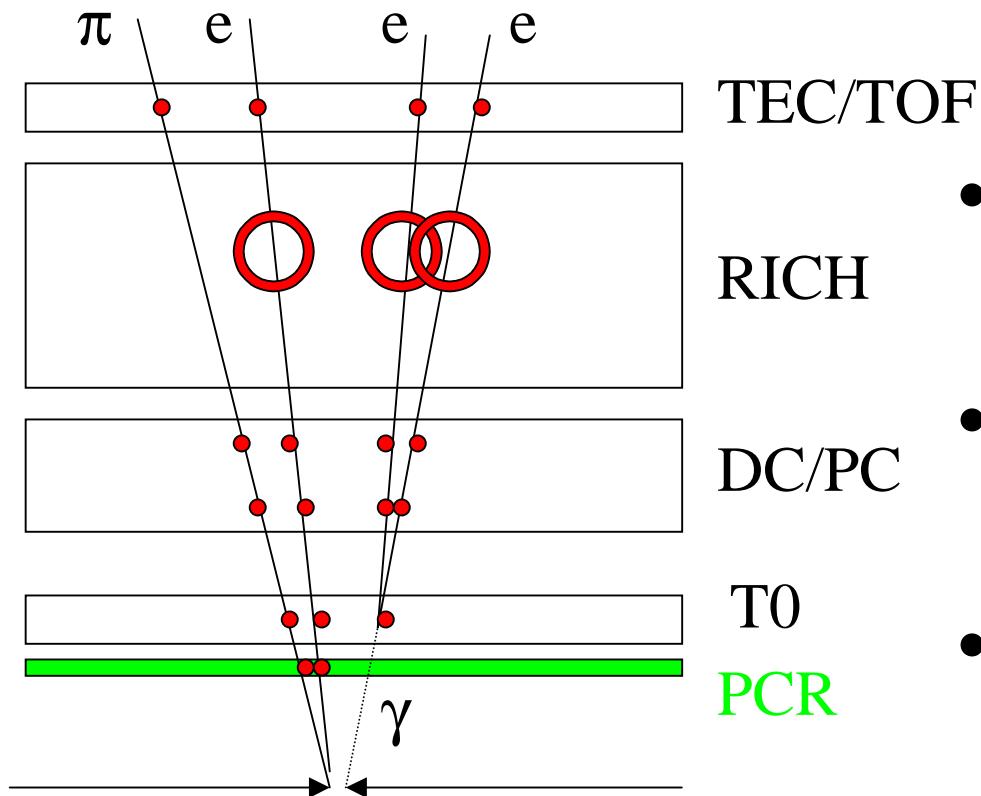
Simulation

with GEANT/pisa
+ reconstruction



- momentum resolution

Photon conversion rejector



- thin scintillator in front of T0
- to reject photon conversion at T0
- high efficiency and low BG

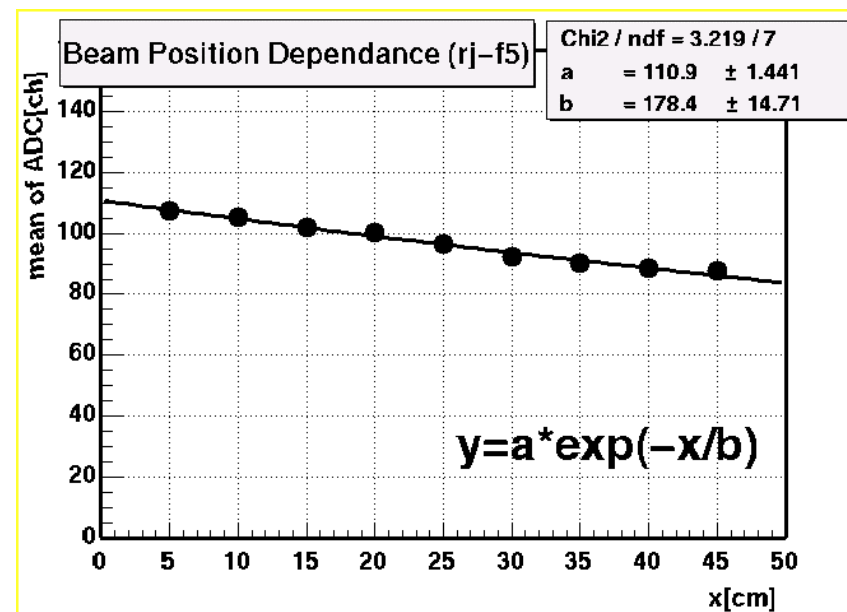
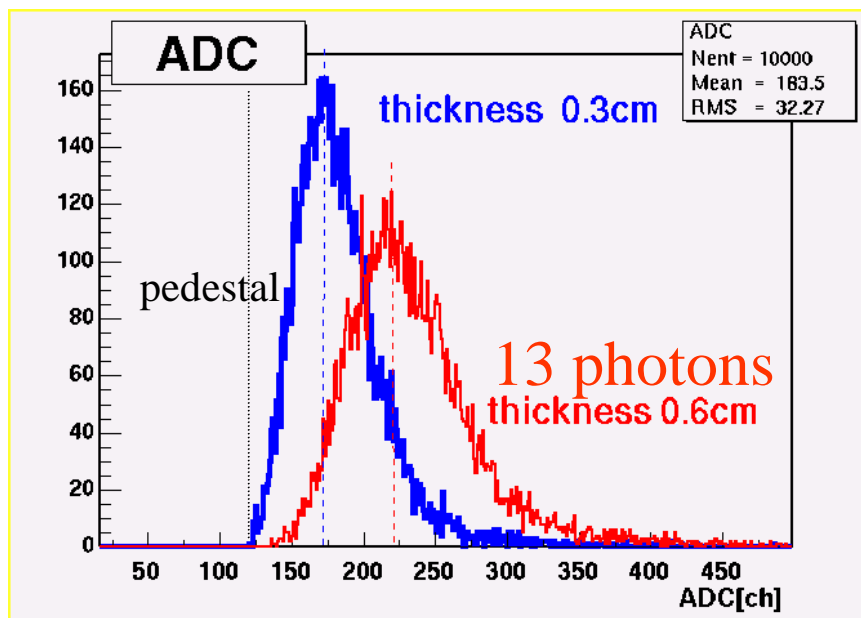
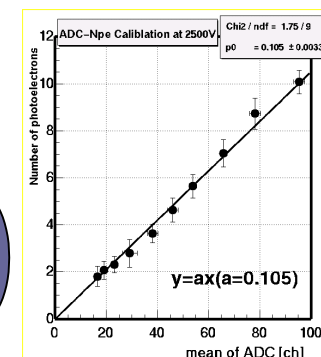
Test setup

$\pi^- (2\text{GeV}/c)$



WLS-fiber
(BCF-92)

Plastic Scintillator
(BC 404, BC408)



Ayako Danmura

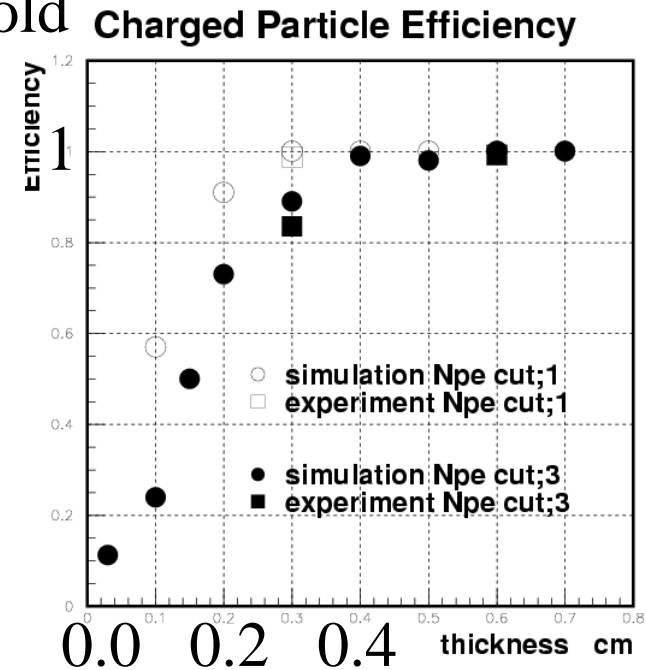
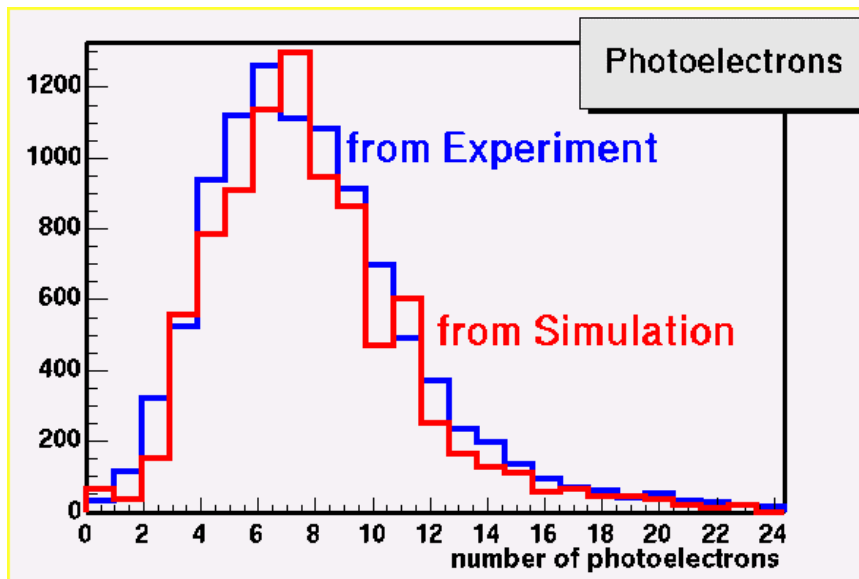
Comparison with simulation

dEdx from GEANT

$\langle N_{pe} \rangle$ from experiment

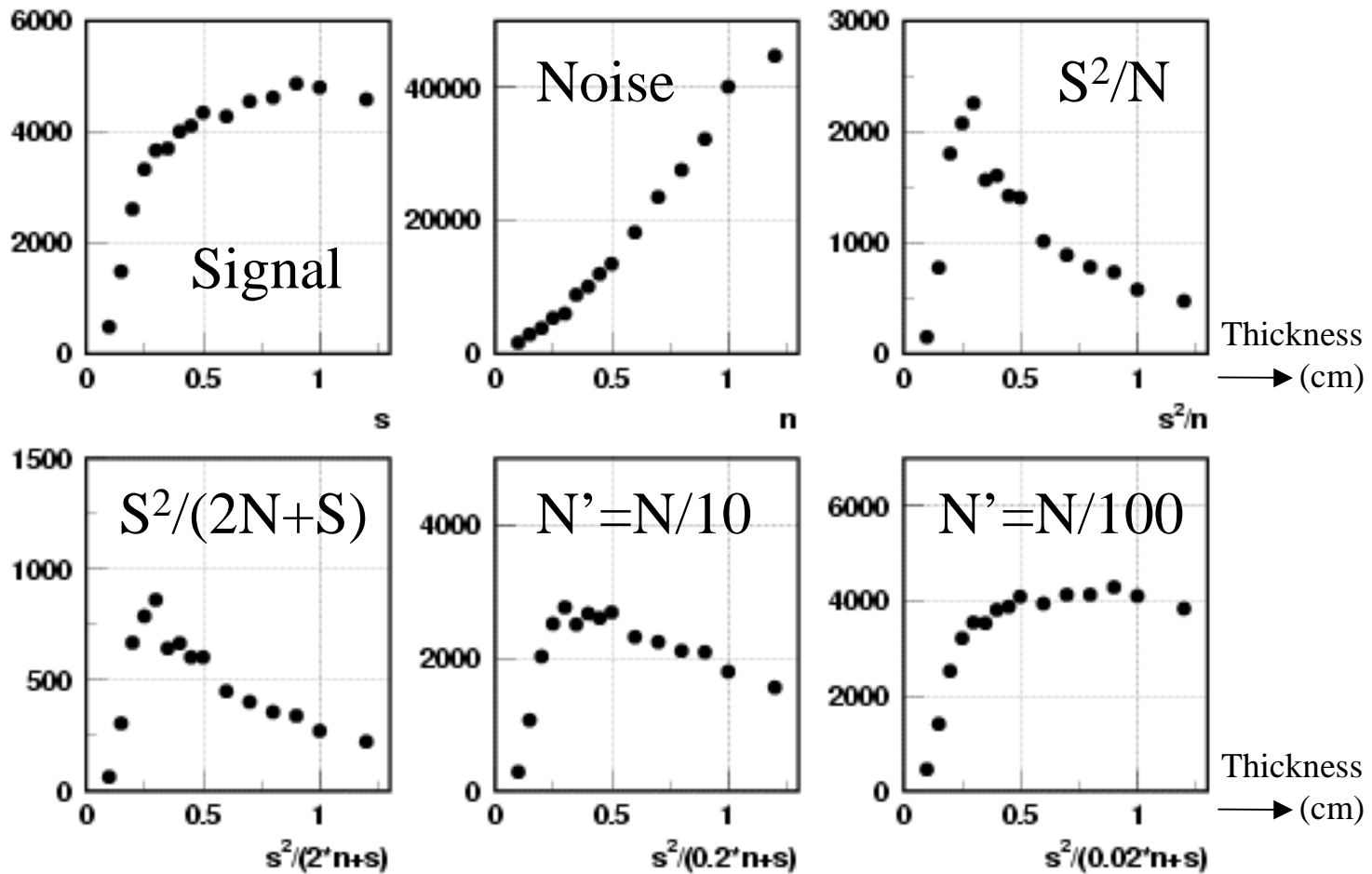
Poisson statistics

count efficiency with N_{pe} threshold



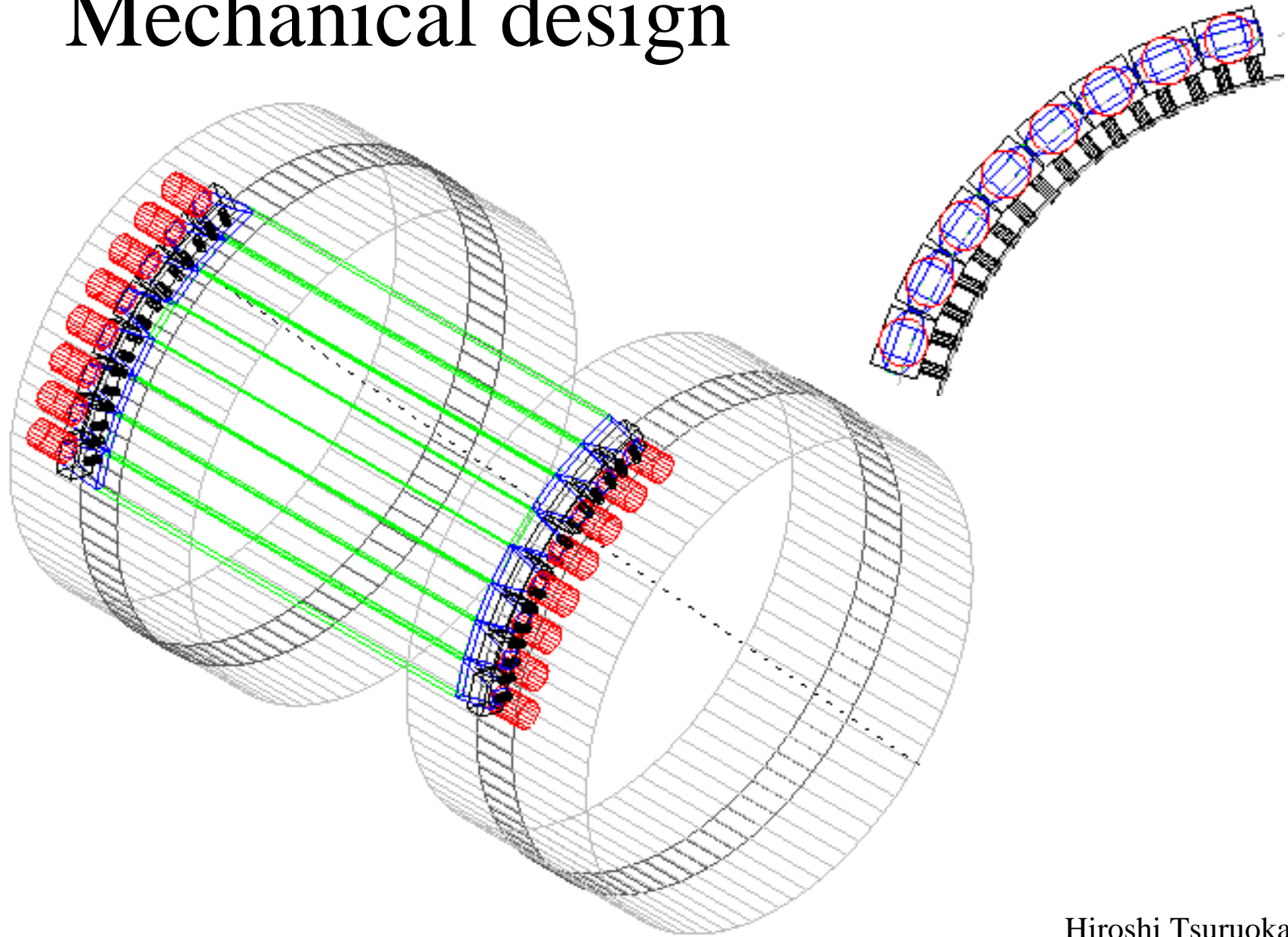
Ayako Danmura

Signal/noise for Φ to ee



Ayako Danmura

Mechanical design



Hiroshi Tsuruoka

Summary

- Time resolution about 60ps
- It does not depend on position nor B-field
- Fine mesh 2inch PMT (R5924) x25 ordered
- 1.5x8x100(cm³) and 10cm light guide x8 slats
- Readout electronics (8ch x 3) from BBC

Open questions

- Photon conversion rejector option? (read-out)
- Removable T0 only for hadron PID run?

Schedule

2001.1	—	fine mesh 2inch PMT (R5924) x25 ordered
2001.3	—	PMT delivery
2001.4	—	scintillator and light guide order mechanical structure design and order
2001.6	—	shipping all the materials to BNL assembly
2001.8	—	installation after heavy ion run one week access to complete