# Svx simulation
# (Summary until June review)

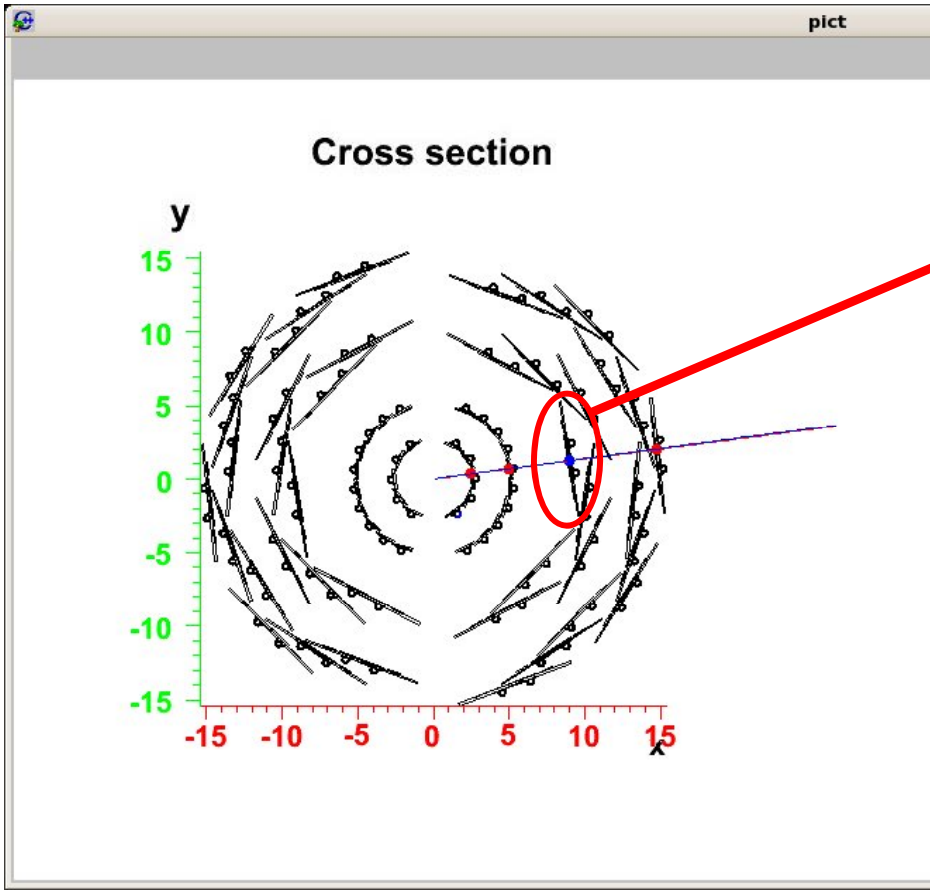
2008/06/12

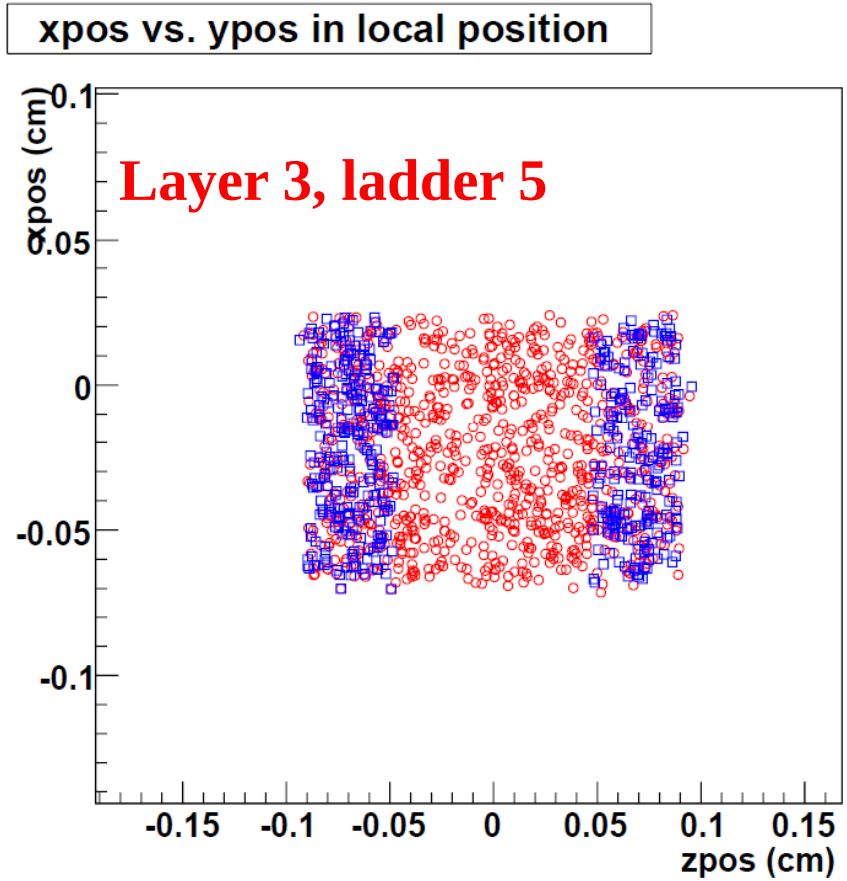
M. Togawa

# (Locally) Changed

- Changed stripixel type for current one
  - Old program has prototype configuration.
- Added charge sharing x-u
  - Default sAQ = 0.10
- Changed gain
  - 1 MIP = 54ch to 100 ch based on cosmic test.
- Added noise
  - Generate by TRandom3. default $\sigma$ = 10.2 based on cosmic.
  - Zero suppression for noise is also implemented.

# Problem for stripixel
# Single pion simulation (local spot)




Single $\pi^+$ simulation

$5<p_T<20$ GeV/c

$-0.01<\eta<0.01$, $0.15<\phi<0.16$

vtx pos : x=y=z=0

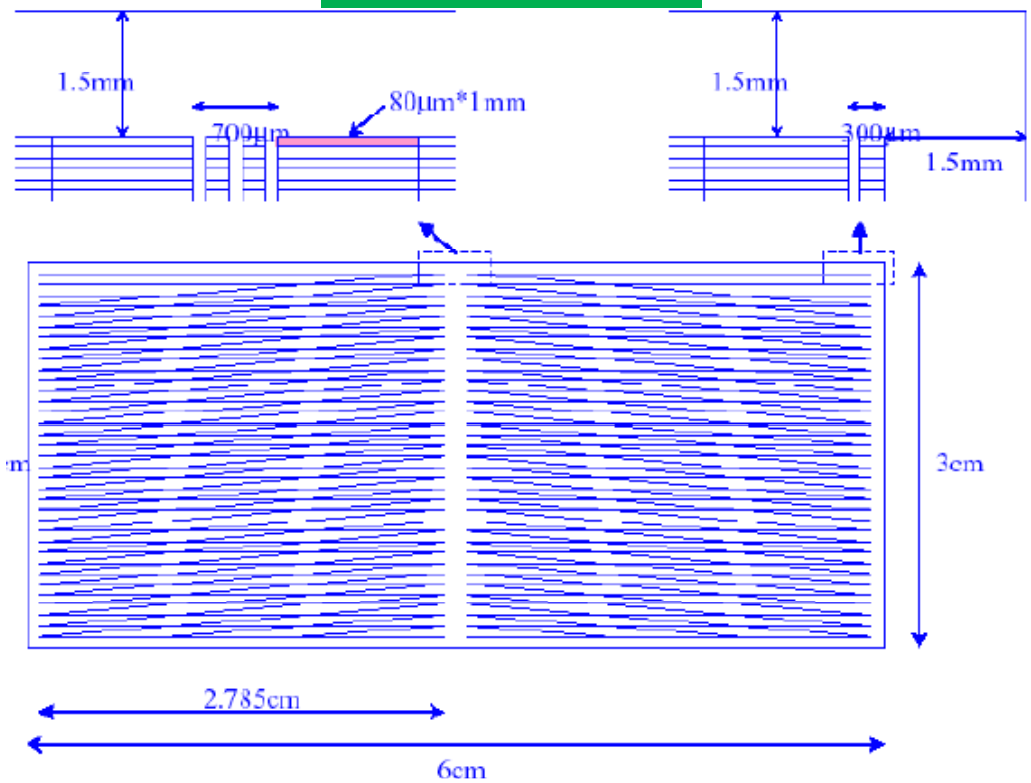
**Red : Geant hit.**

**Blue : Geant hit in case of Rawhit is filled**

**→ Dead area is shown**

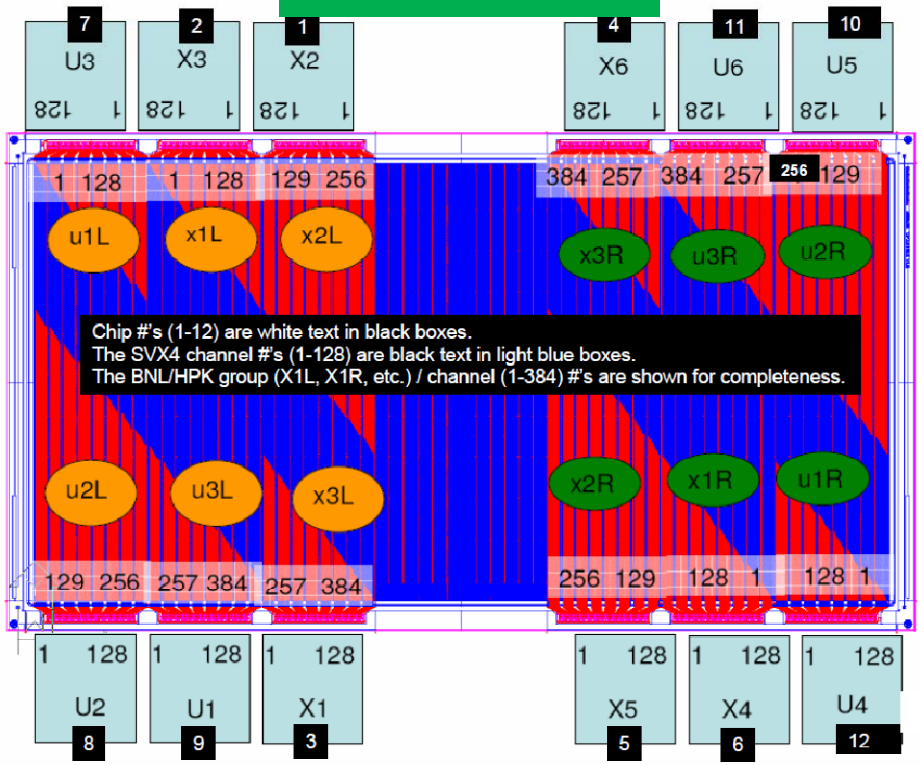
# Change stripixel type

## Old




- Dead area in center and edge of top.
- CH map is mirror image

## Current




- No dead area
- CH map is rotational image

→ Updated to right sensor by changing parameters in SvxStripixel.C

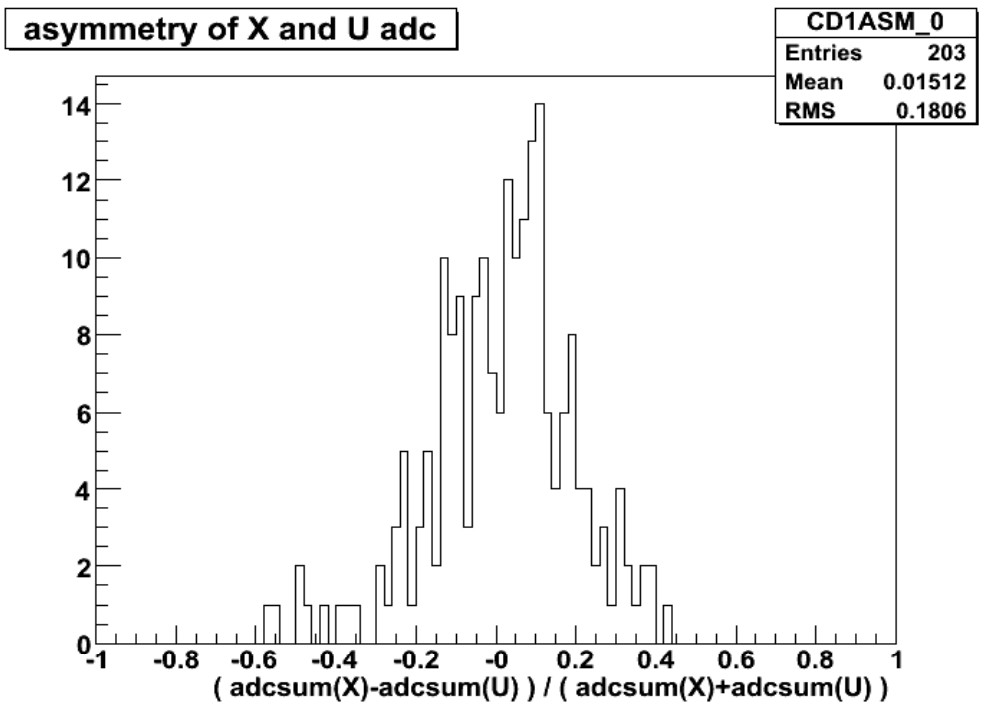
# Add charged sharing

- Sharing btw x-u has been already included, but it is just shared as half.
  - x-u charge fraction will be implemented.

Results from ROC3 cosmic test

Parameter : charge asymmetry

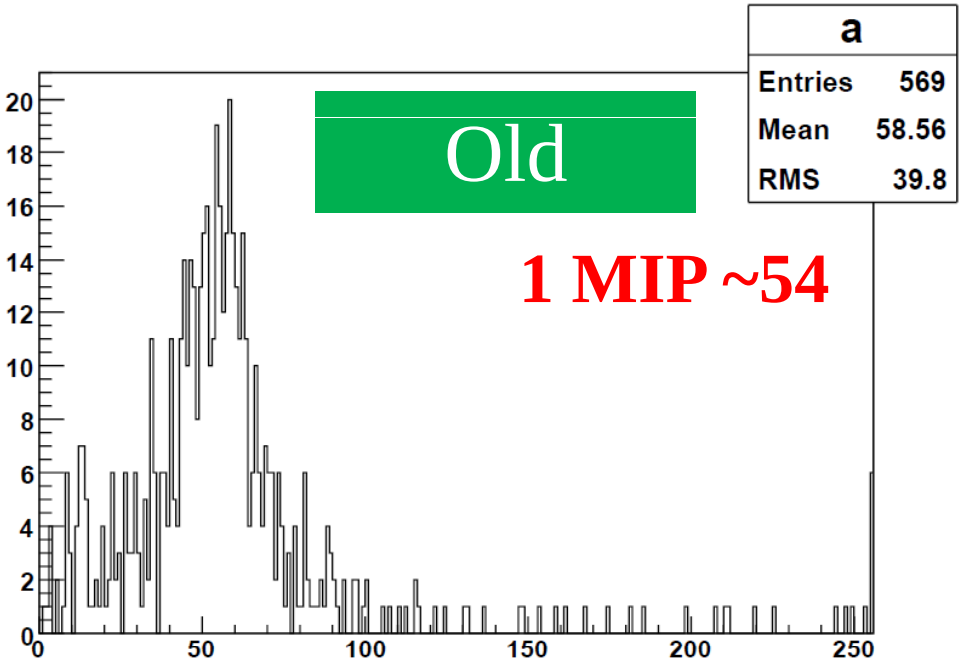
$$A_Q \equiv \frac{Q_x - Q_u}{Q_x + Q_u}$$

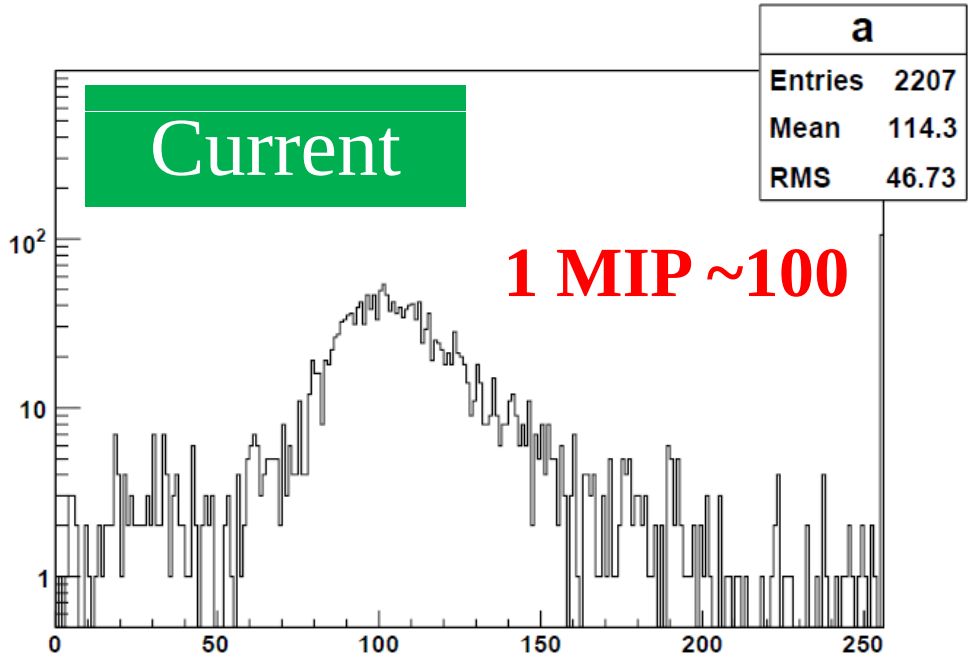



Right picture is low stat.
I heard σ ~ 0.10 with gaussian fit for high stat. data
→ Default value
(can be provided in production macro)

# Change gain

- 1MIP ~ 100 ch for each read out from cosmic data
- Looked MIP peak after from the single pion simulation (almost no sharing btw strips)



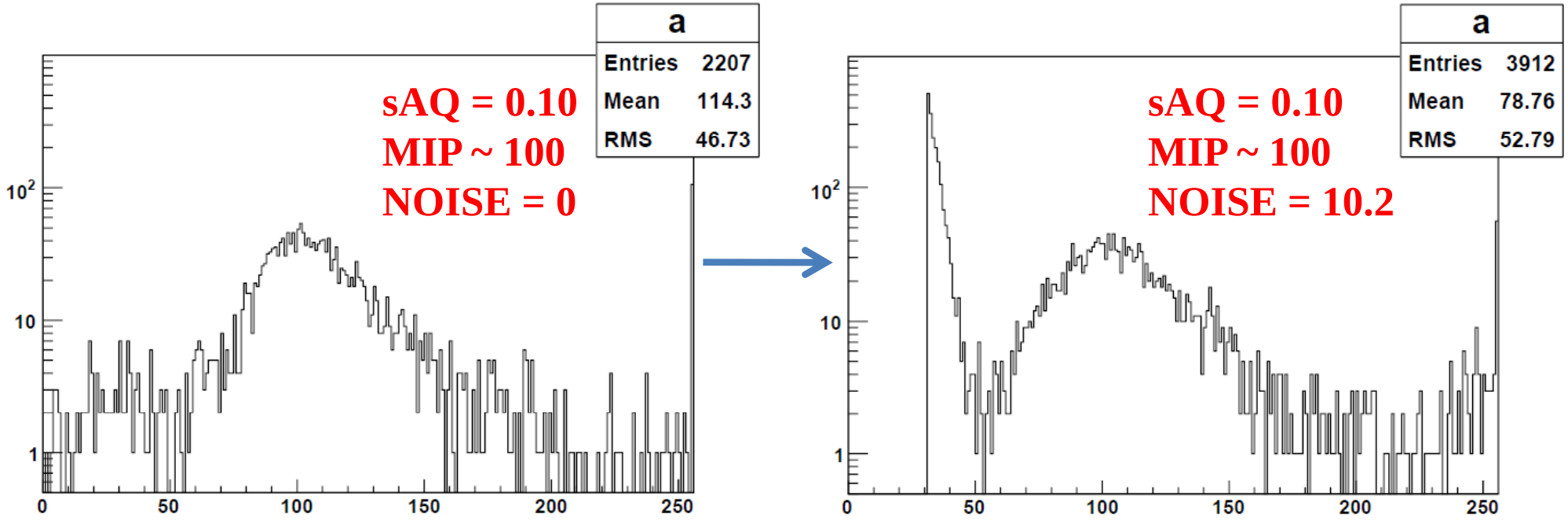




- dE/dx (GeV) / 3.6 (eV) * 0.0038 ~ 200 ch for 1 MIP

  0.0038 is hard coded as adcgain in SvxStripixel.C

# Add noise

- NOISE ~ 10.2 ch (1 sigma) from cosmic data
- For filling noise data to SvxRawhit, zero suppression is applied : (default = 10 ch)
  - No zero suppression for geant related hit.




AddNoise() method in SvxStrip11v1 class

# How to change parameters in production macro

- In production macro,

```
SubsysReco *svxSim = new SvxSimreco("SVX");
(dynamic_cast<SvxSimreco*>(svxSim))->set_ReadParFromFile(1);

        // change A_Q from 0.10 to 0.12
(dynamic_cast<SvxSimreco*>(svxSim))->set_ChargeAsymXUWidth(0.12);
        // change noise from 10 to 15
(dynamic_cast<SvxSimreco*>(svxSim))->set_StripixelNoise(15.0);
        // change zero suppression for noise from 10 to 20
(dynamic_cast<SvxSimreco*>(svxSim))->set_StripixelZeroSup(20);

(dynamic_cast<SvxSimreco*>(svxSim))->Verbosity(1);
se->registerSubsystem(svxSim);
```