nue search in ECC

Nue search with HTS

hadron

Electromagnetic shower

hadron

Shower detection efficiency estimated by simulation

Upstream

Downstream

ECC 10GeV

ECC 5GeV

ECC 2GeV

CS 10GeV   CS 5GeV   CS 2GeV

Plate

CS 2GeV
CS 5GeV
CS 10GeV
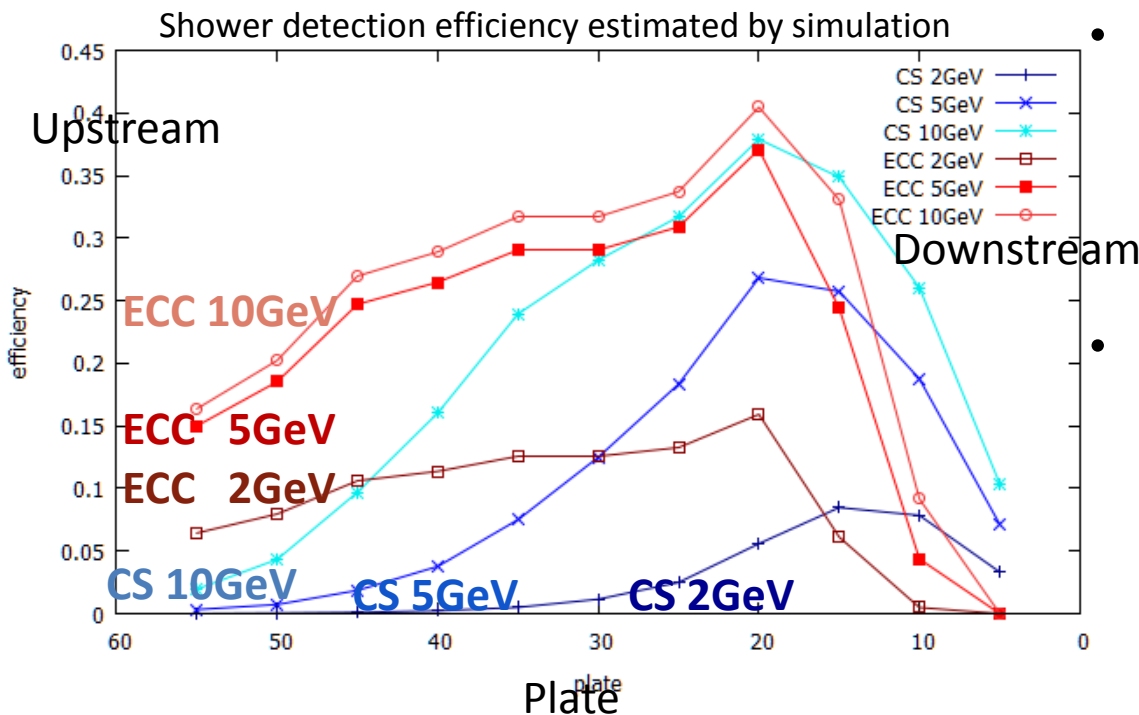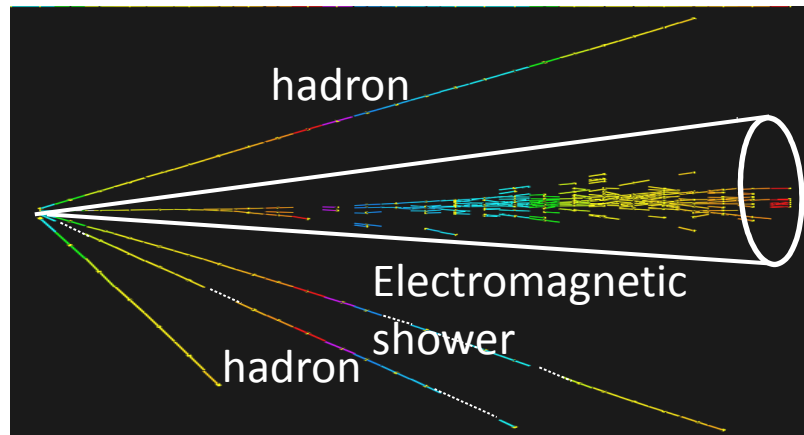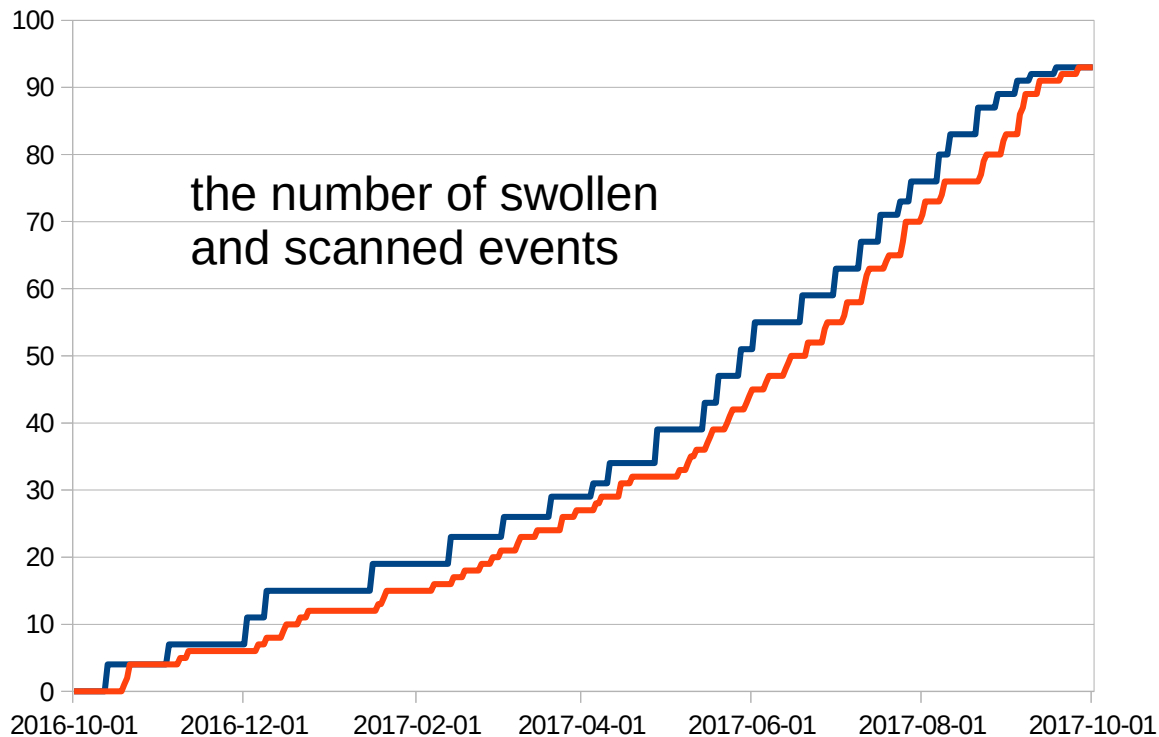ECC 2GeV
ECC 5GeV
ECC 10GeV

- Large volume ECC scanning with HTS have been started to detect nue interaction events at the upstream of ECC.

- I have introduced a new shower search method and it will increase the efficiency of low energy / upsream nue events about 2 times.

Scanning status

the number of swollen and scanned events

91 events
(upstream from film 18)

— swell
— scan

- All NC-like events interacted in upsream from PL40(film18) were scanned until last September.
- Now detailed analysis (shower search and manual check) is ongoing.
- After that, additional events will be scanned if possible.

Tool development for nue identification

3D track viewer

- This can render 10^6-10^7 tracks output from HTS and extract from them with flexible conditions.

- Used to confirm vertex and electron shower.

Scanning machine for manual check

- Track data output from HTS is unusable with old manual check machine.

- New system have been developed and now used to check whether the shower is created from a primary electron.
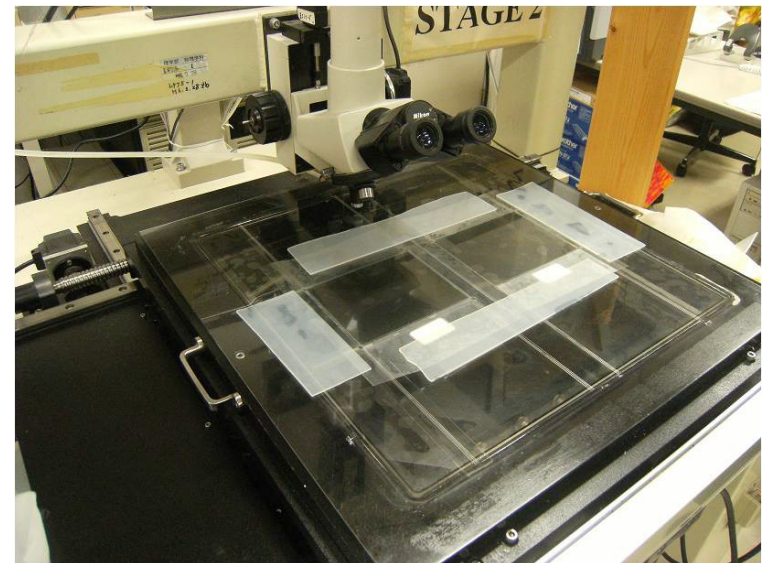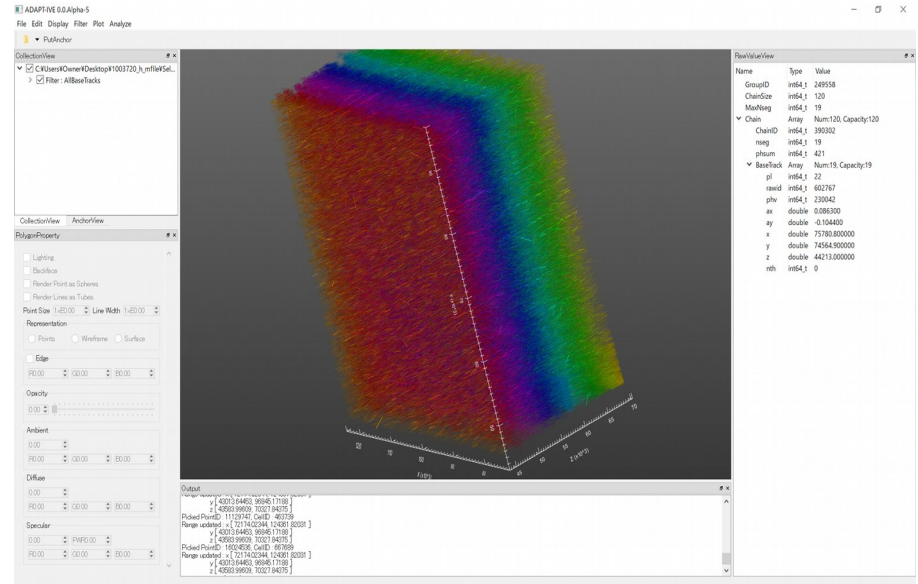
Analysis Status

91 events were scanned and processed.

1) failure in netscan process		3
2) failure in vertex search		3
3) process done	no new shower	54
	new shower found	31
total		91

- 1) Failed in distortion correction or alignment at many plates, so it is difficult to recover.
- 2) To be rescanned.
- 3) 31 showers have been newly found and they will be analyzed to judge whether they are nue events.

New nue candidate

vertex
film 11
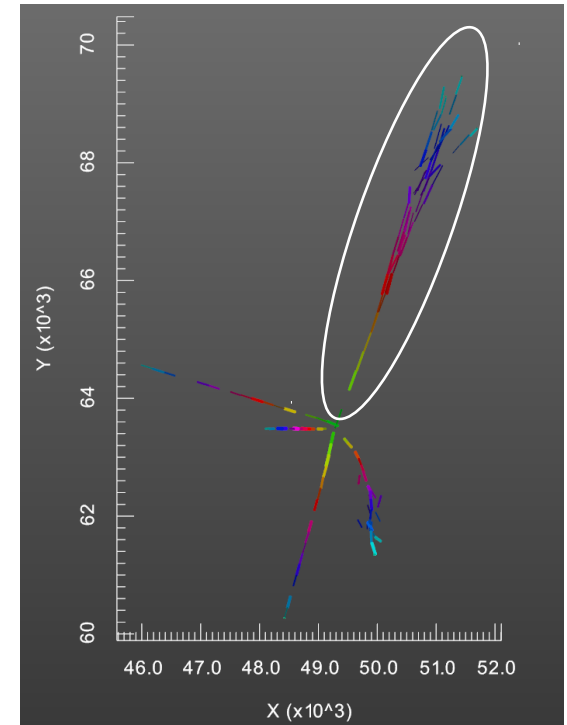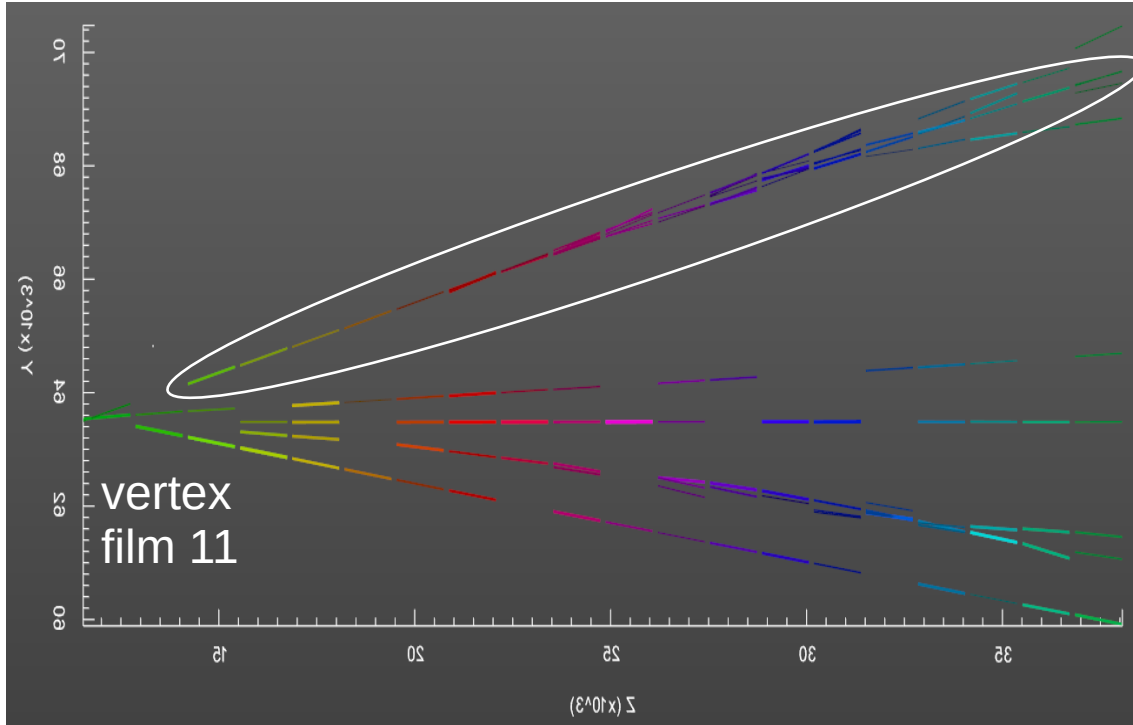
- 1 new nue candidate was found.
- It is confirmed that there is only a primary electron at film 11-14 by manual check.
- Manual check of the other events including electron showers is ongoing.

Summary

- 91 NC-like events interacted in upstream from film 18 were scanned.

- New electron showers were found from 31 events.

- 3D track viewer and manual check machine was developed to find nue from them and 1 new nue candidate was found.

- Manual check of remaininig 30 events including newly detected electron shower is ongoing.