# CHERENKOV DETECTORS

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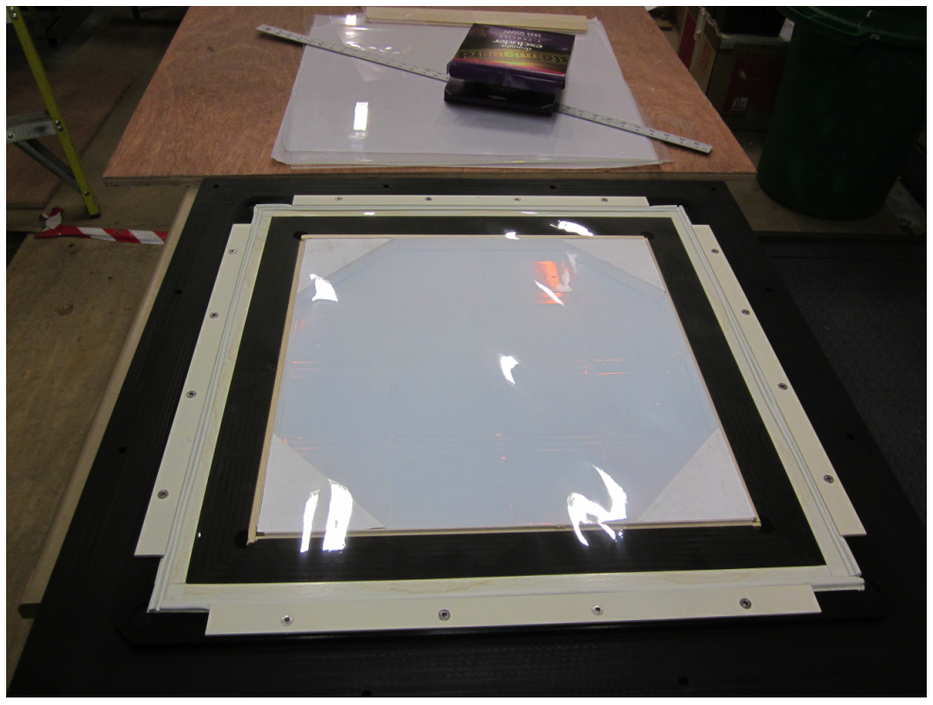
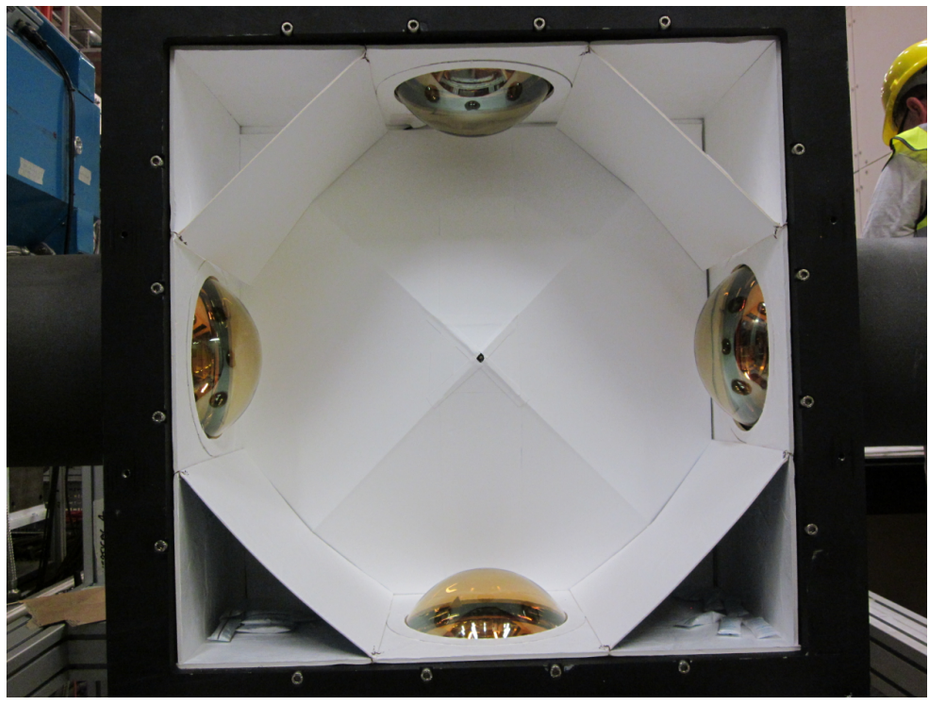
# PREVIOUSLY...

## CKOV Update

June 2011

- Replaced 2mm Schott Glass window with 5mil Acetate to reduce background in CKOVa/b.
- Replaced Tyvek with GORE Reflector Panels in CKOVb, replaced in DSA.
- Re-established HV connections and supplies.



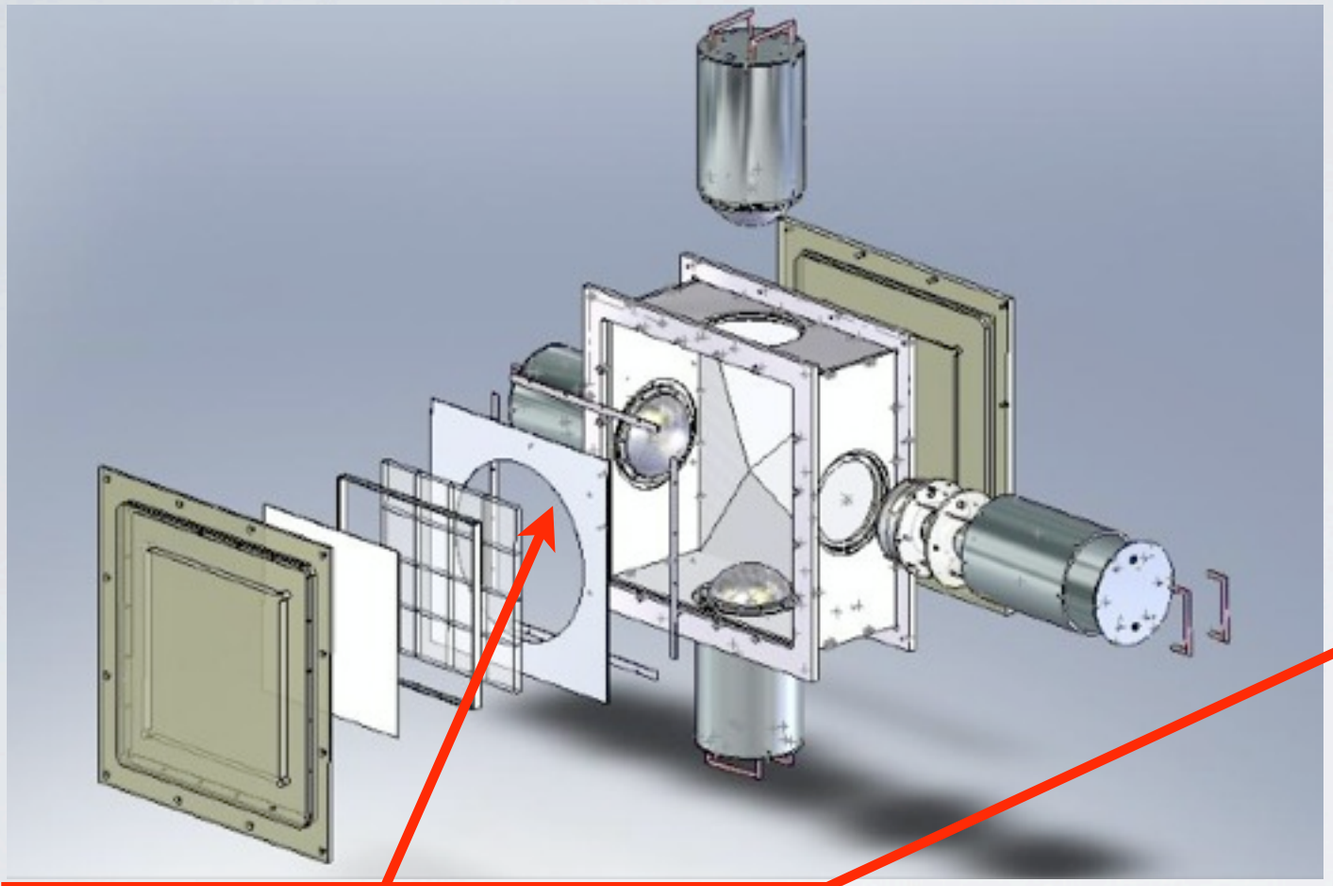


July 2011-

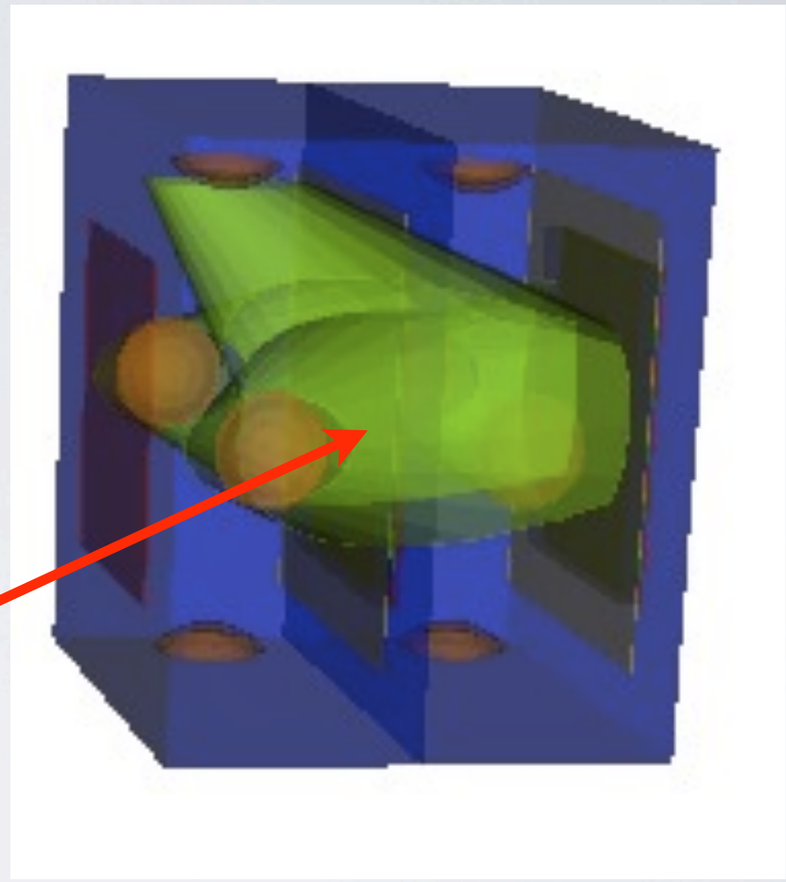
- Electron runs to establish beta=1 light yields.
- Pion/mu runs to investigate background light.

Presented at CM 30

# CHERENKOV GEOMETRY



NEW WINDOWS



- The geometry has been updated in MAUS to reflect this change.
- There were additional changes that were made to existing materials.
- These changes have yet to be merged with the trunk.

# UNPACKING THE CHERENKOVS

- UnpackEvent.cc handles fADC channels and associates them with Cherenkov and TOF detectors.
  - it outputs data as a JSON file that is human readable and easily manipulated.
- The fADC class is used to find pedestal values, find the range of fADC values and integrates the pulse (only works for positive peaks)
- Currently working on MapCppCkovRecon.cc to handle higher level analysis.

# CKOV JSON STRUCTURE


```
"ckov": [
        {
          "V1731": [
            {
              "ldc_id": 1,
              "charge_mm": 1,
              "equip_type": 121,
              "phys_event_number": 3,
              "charge_pm": 1,
              "channel_key": "DAQChannelKey 1 9 0 121 ckov",
              "position_max": 0,
              "samples": {
[
                  143,
                  142,
                  143,
                  142,
                  142
                ....
              ]
            },
            "trigger_time_tag": 319531766,
            "time_stamp": 1280930824,
            "detector": "ckov",
            "part_event_number": 0,
            "geo": 9,
            "pedestal": 142,
            "channel": 0
},
```


pulse integrations do not work yet.

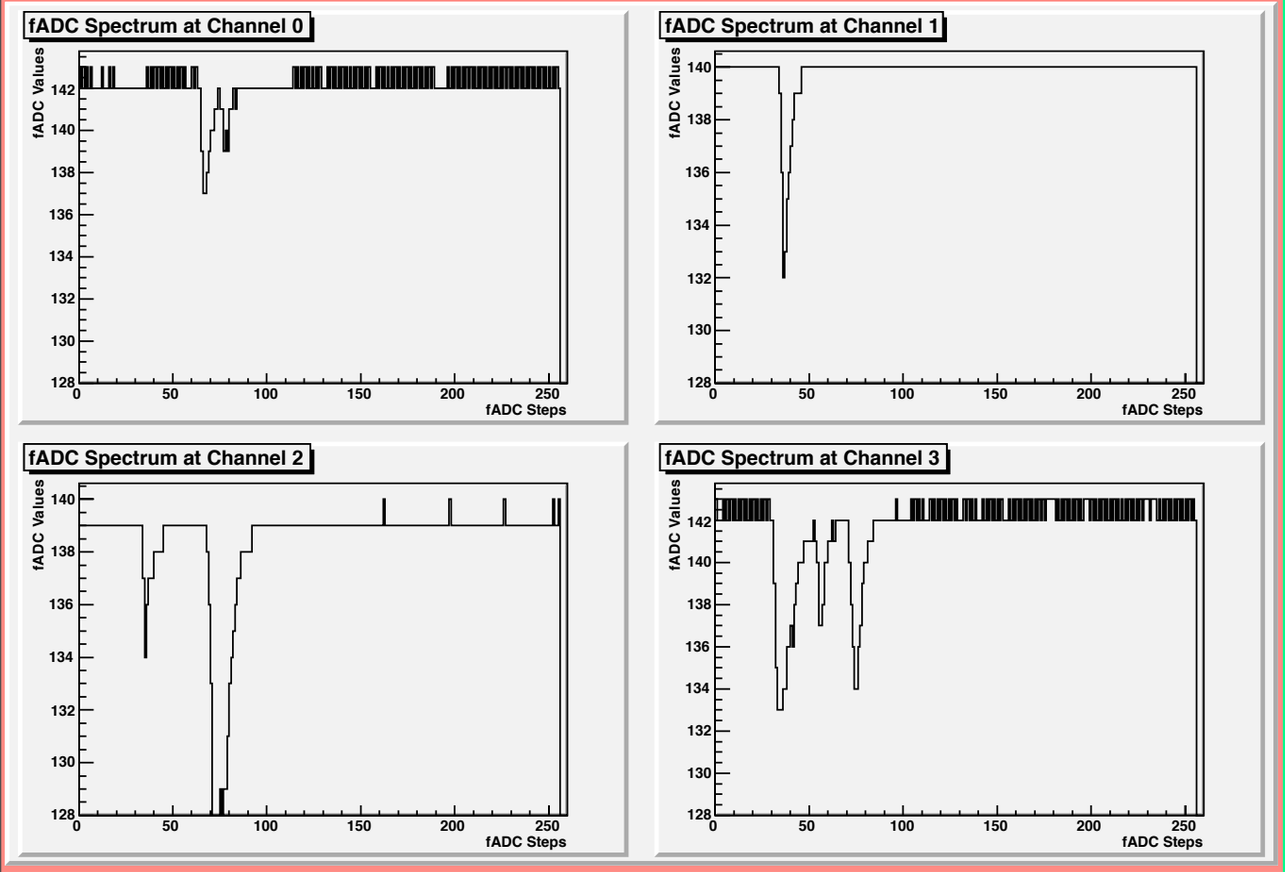
fADC smaples (256 values)

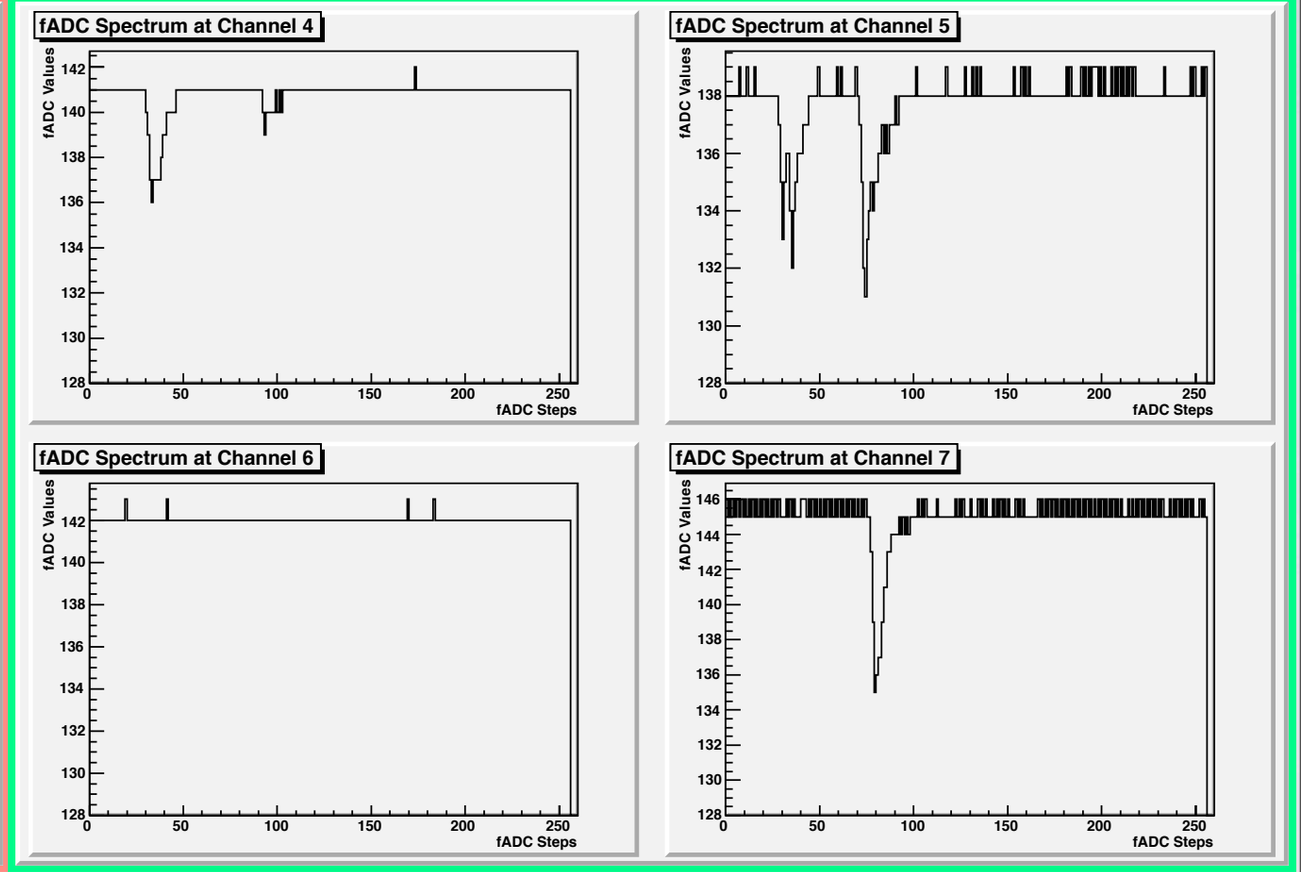
time of readout according to LDC computer

spill number

pedestal finder works

# fADC PULSE SHAPES (IN MAUS)




Ckov B

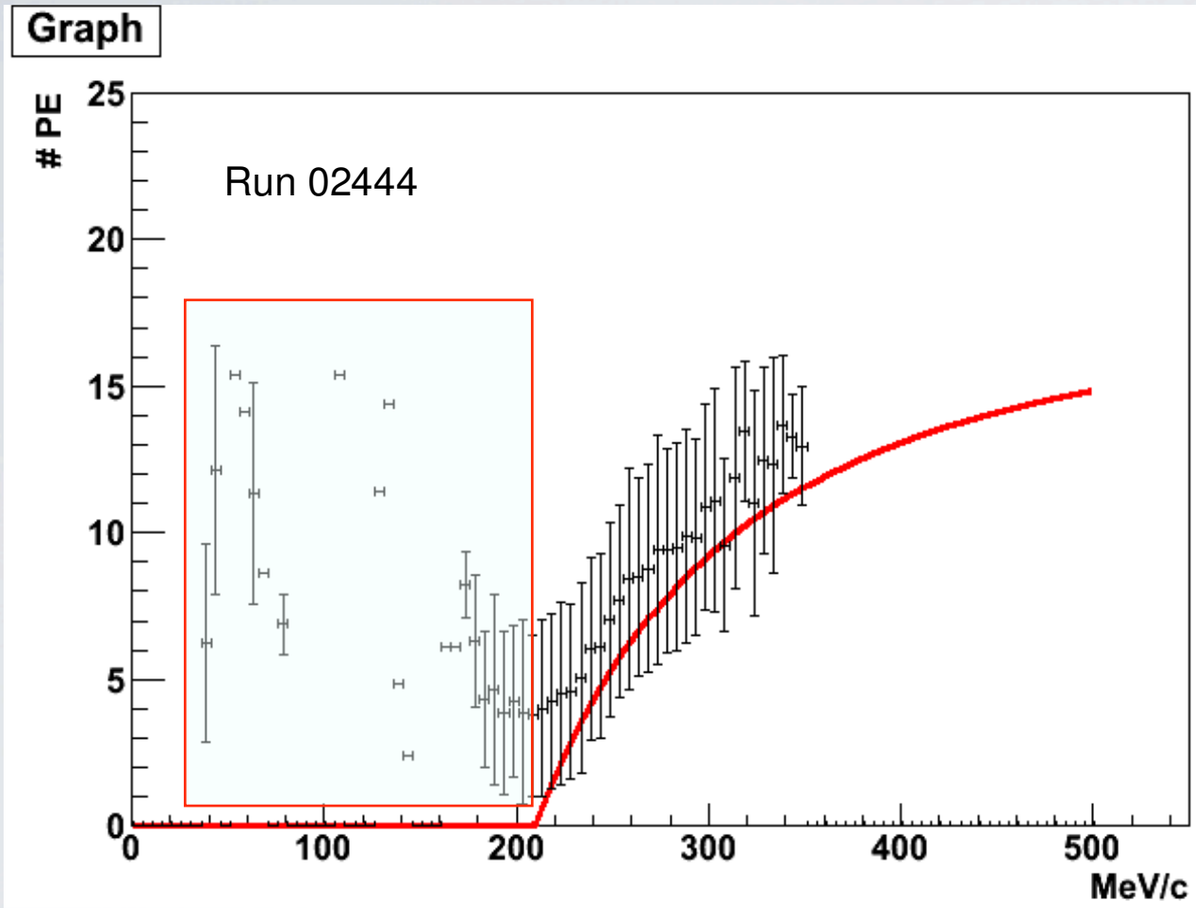
Ckov A

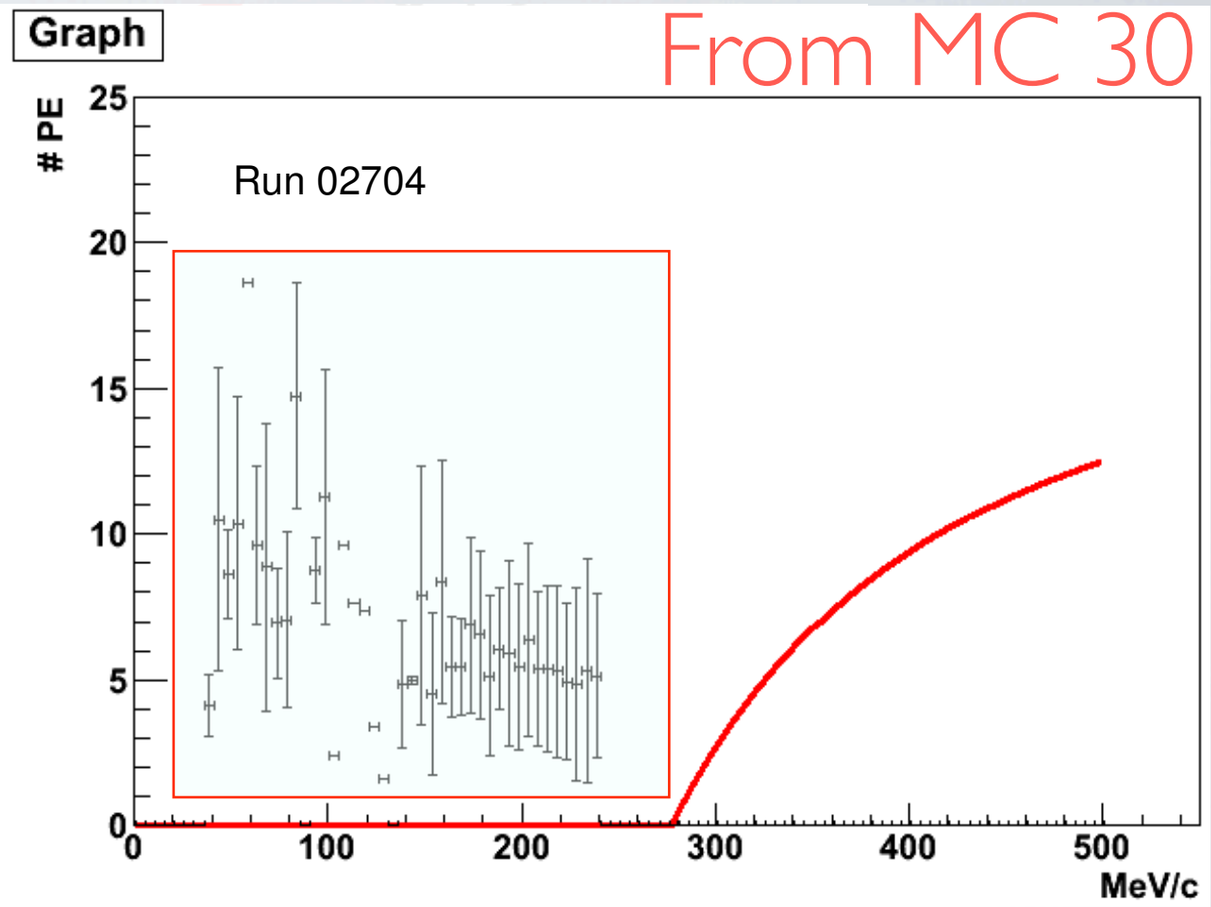
- A single event sometimes has multiple pulses, and;
- The number of coincidences varies

# THINGS TO DO

- Finish peak recognition and integration algorithms.
- Pick out spills above threshold momentum with varying momenta spectra
    - Use TOF and Tracker hits to reconstruct momenta and match them to Ckov hits
- Create Coincidences
    - Prioritize events with the most coincidences and largest combined area
- Analyze new data (taken with new acetate windows)
    - See if there is light below threshold.

# BELOW THRESHOLD LIGHT




From MC 30

Hope to see below momenta threshold fACD hits disappear.

*...The sound and fury signifying nothing (at least not pis or mus)*

# CONCLUSION

- Ckov Geometry is updated but not merged.
- The Ckov is now unpacked; the first steps of ckov reconstruction are underway.
- Finish implementing G4MICE analysis in MAUS by CM32.
- Thanks to Dr. Cremaldi and Peter Sonnek for their work on the Cherenkovs.