

Software and Analysis for FDIRC Prototype

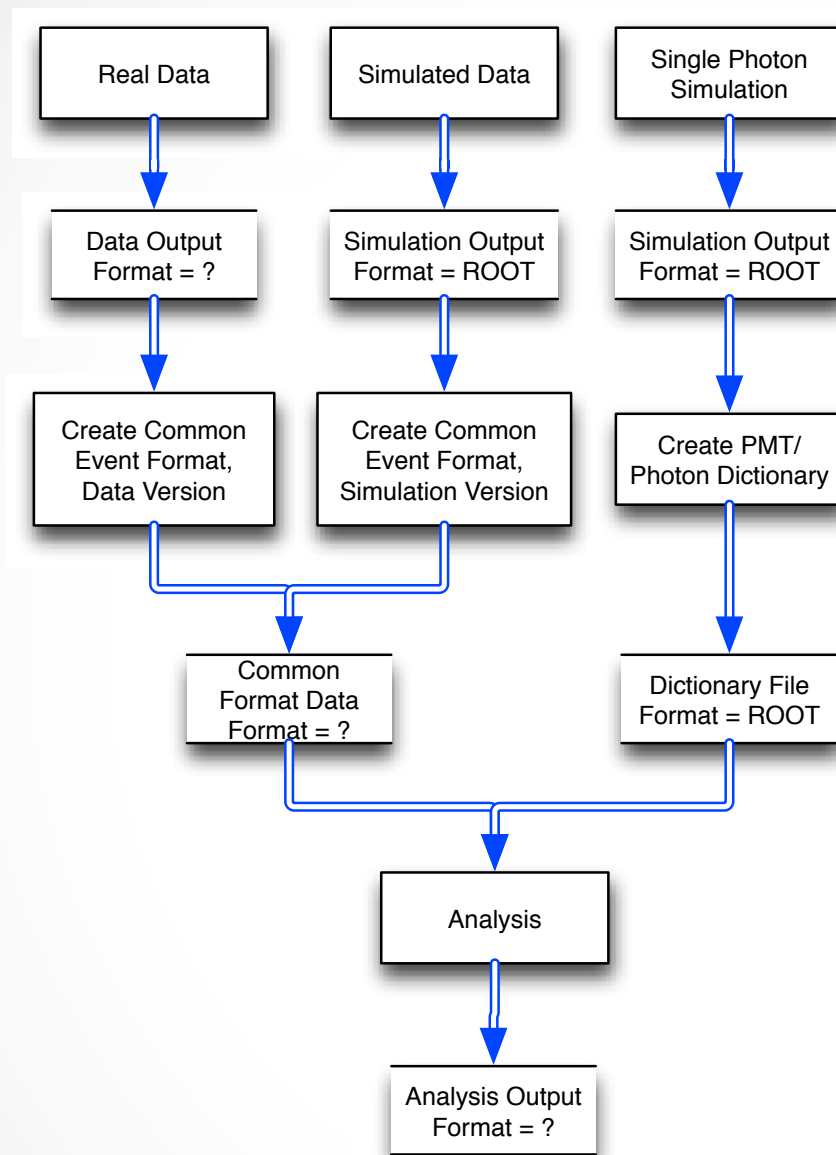
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Goal

- The prototype will be taking data soon (hopefully!)
- We want to be ready to analyze, understand and debug data right away.
- There is a lot of preparation that can begin now.
- At the moment, I would say that we have lots of bits and pieces of things but no overarching organization structure
- On the other hand, we shouldn't build a monster
- Ease and clarity of use is key
 - Read "Documentation"





Flow of Data

- Currently have a mix of ASCII, ROOT, FORTRAN, C++
- That's probably ok at the top level of this tree
 - Use the best tool
- But further down, we should converge on a format
- Would like to treat MC and Data with same tools
- Ideally, could apply this to 1st prototype data
 - Probably scope creep

Where To Put Things?

- Communication:
 - Nicolas has created an e-mail reflector. Please use to keep everyone in the loop. Also helps to keep a record.
 - Would HyperNews or something similar be useful?
 - Regular or semi-regular meetings?
- Documentation
 - Where? SuperB Wiki? Alfresco?
 - Need to agree on conventions, numbering, coordinates, etc.
 - Jerry has already started "Critical Dimensions" document.
- Software
 - Everything should be in SuperB svn. I think this is the only way that we can easily share and collaboratively develop code. But you have to be a SuperB member.
 - Now would be a good time to start thinking about how to organize code and packages



Converting Some CRT FORTRAN/HBOOK to C++/ROOT

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On behalf of Ellie Twedt
University of Maryland



CRT1 Data format

Ascii file from Kurtis
(Hawii)

Event

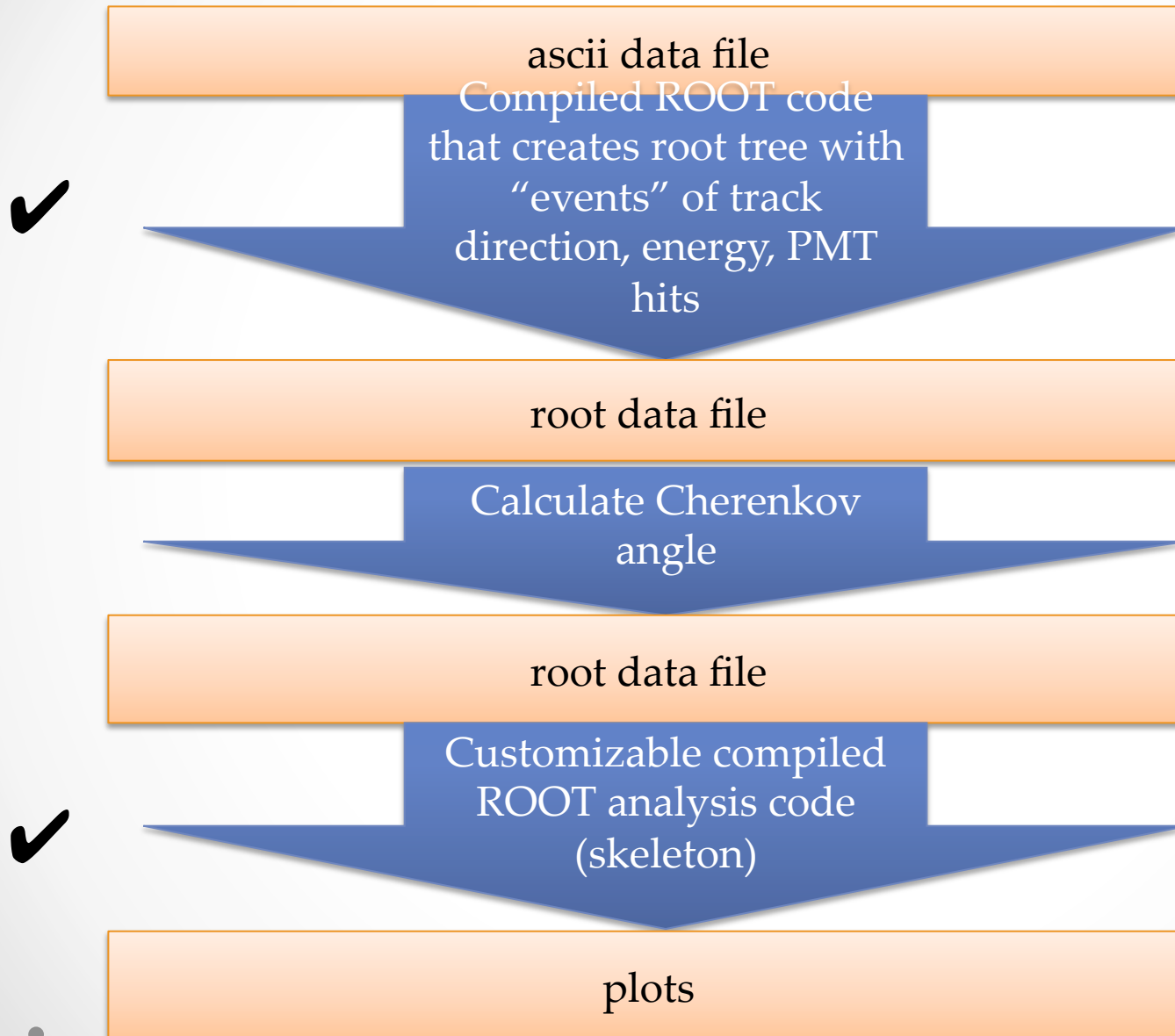
44 line Header

(date/time, hodoscopes, stack PMTs, trigger hits, etc.)

224 lines of fDIRC PMT data

(8 lines per BLAB2, 4 BLABs per tube, 7 tubes total)

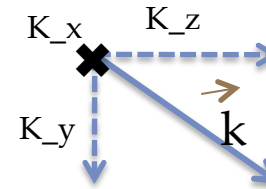
Current status and goal



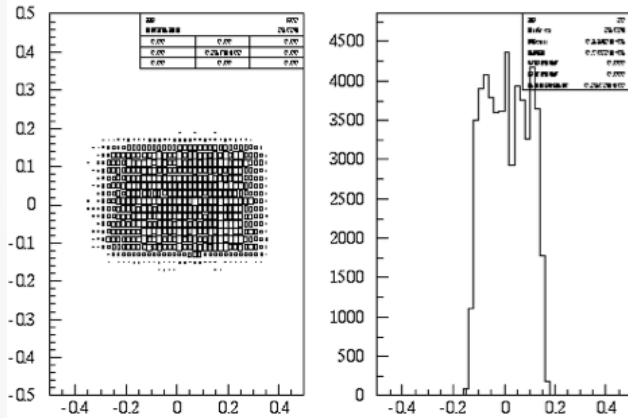
This is all currently done by FORTRAN code that creates PAW plots

Comparison of some "old" and "new" plots

Track direction:

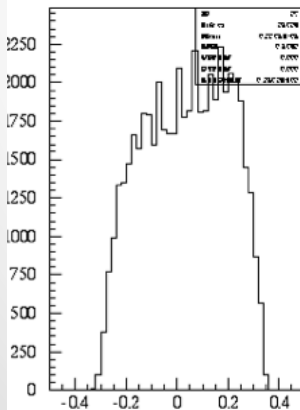


old

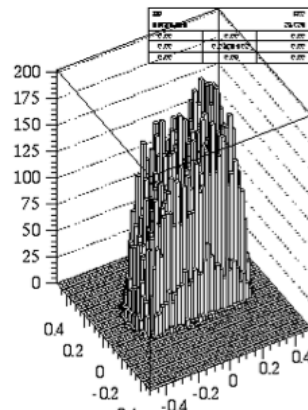


Track direction cosines - cy vs. cx

cy distribution

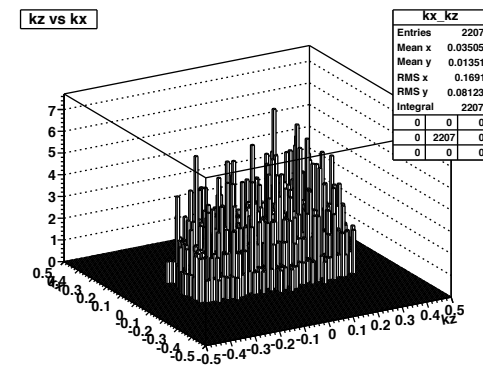
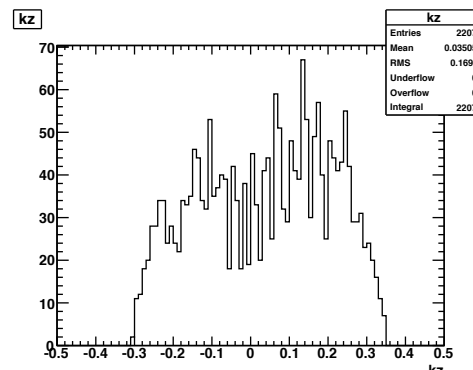
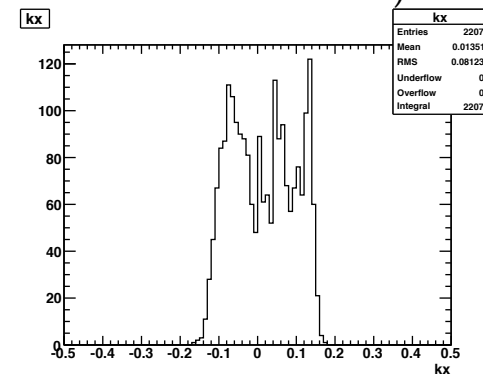
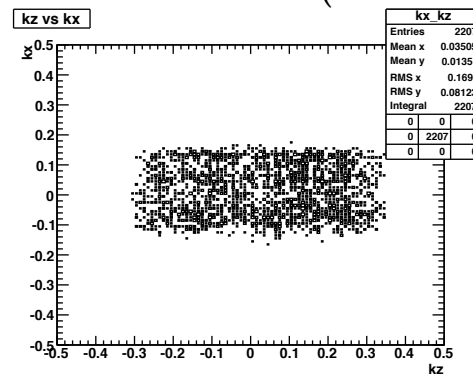


cx distribution



Track direction cosines - cy vs. cx

New
(small subset of data used in "old")



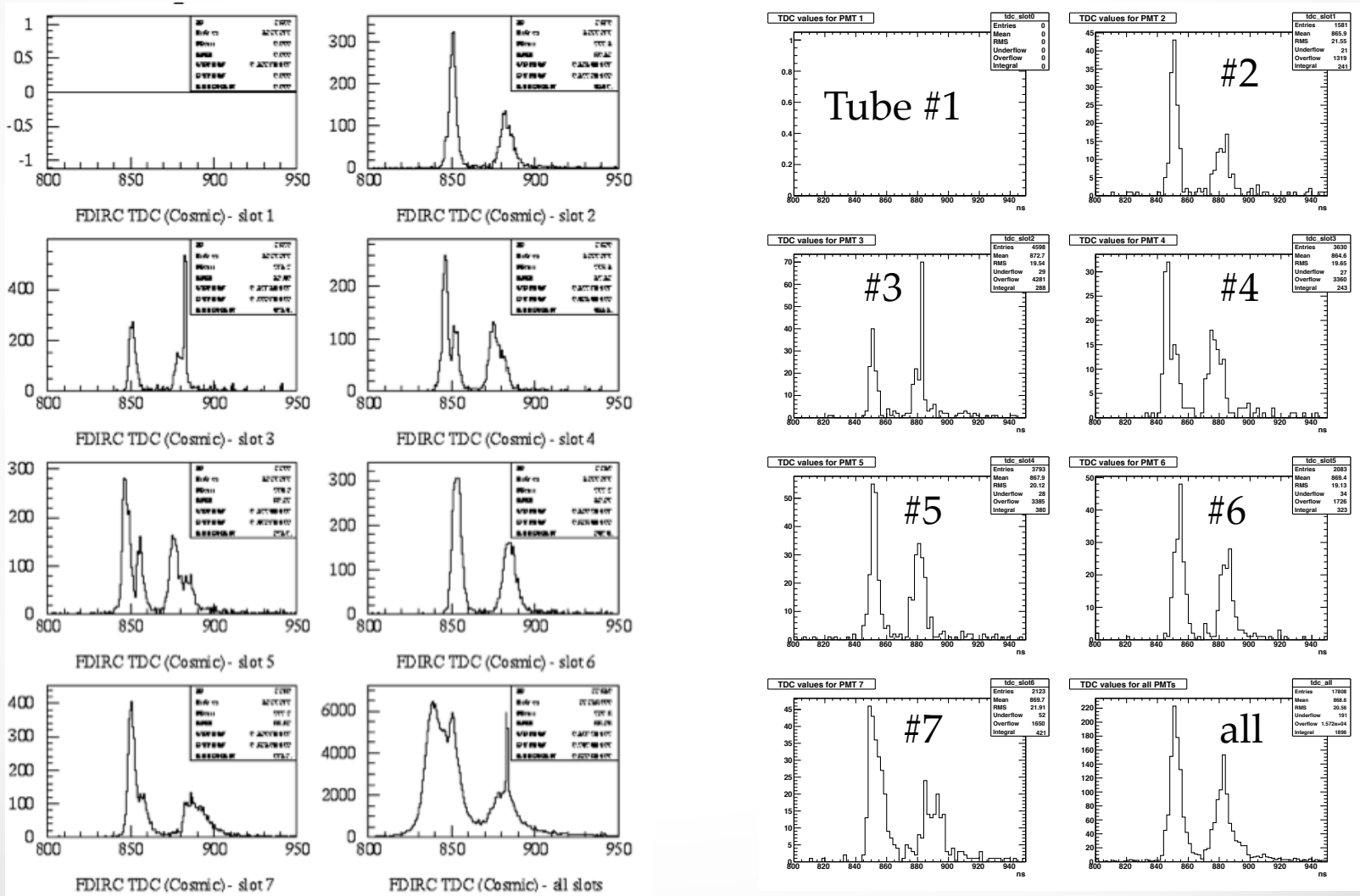
1

“new” plots

“time” of pulse in fDIRC PMTs

old

new



Still to be done

- Implement dictionary / LUT to determine Cherenkov angle from PMT hits
- Run on full dataset to validate against all “old” plots
- Reformat output of old/new simulation to make identical root trees, so common analysis code can run on both MC and data

Some nagging questions

- “pixel” (or channel) of PMT recorded in root tree. Should this be in electronics space or pad space?
- Keep muons of all energies, or just those with $E > 1.6$ GeV?
- Currently “time” is absolute (unix) time. Change to be relative to first event in current file?
- Common (well documented) axis/numbering system?



User Analysis

- Could commit small(ish) data file (ascii) and all root code to svn. Where?
- Common area for all CRT data, both old and new?
- Accessibility of MC for old/new?
- Format for soon-to-come CRT data same as last year? Need different root-tuple maker, but keep consistent analysis code?