Status of the CORRFW development

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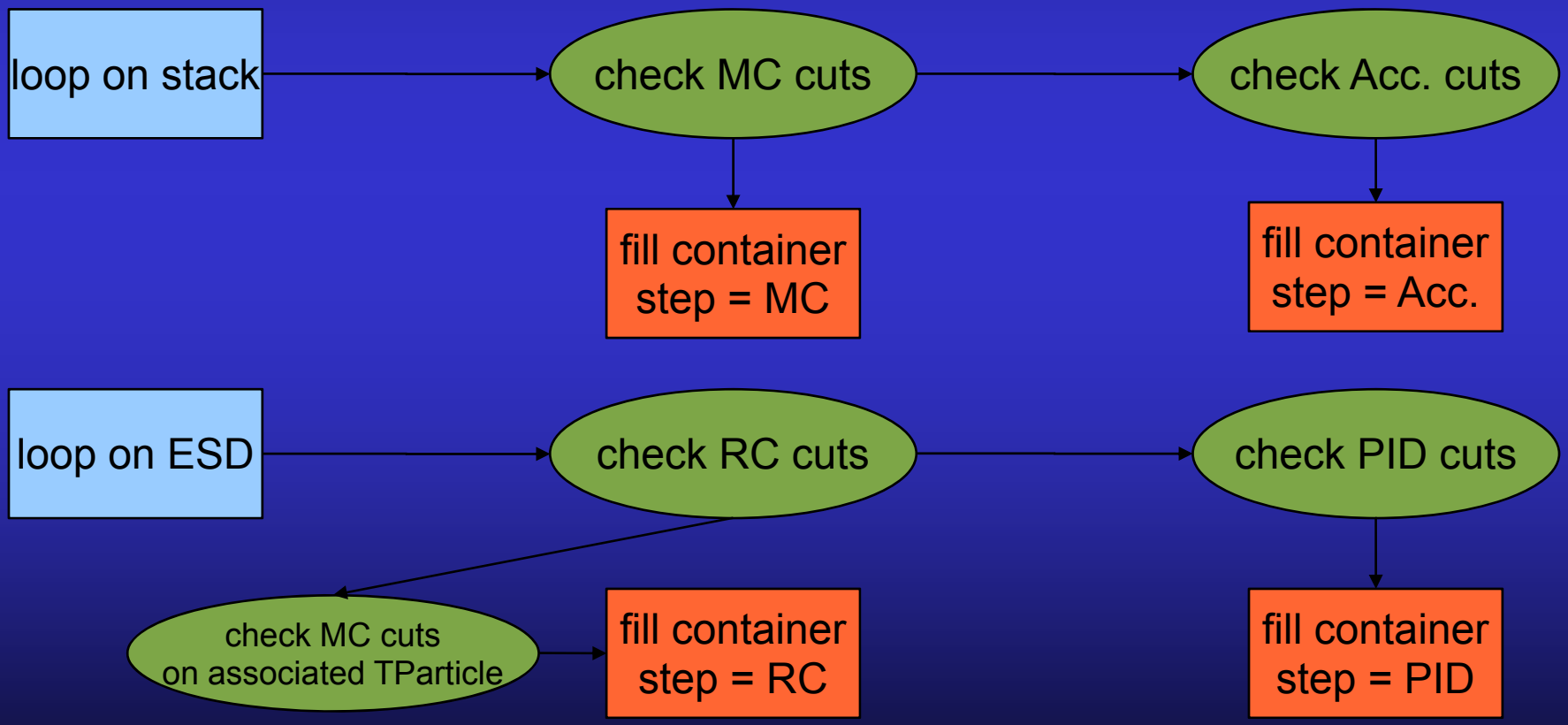
How to perform a correction ?

possible correction steps for an analysis :

MC : Monte Carlo (reference)
Acc : in acceptance (geometry + track refs.)
RC : reconstructed
PID : reconstructed after PID selection



The Container

- The container is the tool used to draw any correction map
  - *corresponding class : AliCFContainer*
- n_steps : number of selection steps chosen to study efficiency
  - *e.g. in previous slide : 4 steps*
- n_variable : number of variables
  - *function of which will be drawn the correction map*
  - *e.g. pT, eta, Z vertex position...*
- The container is a *(n_variables+1)*-dimension matrix
- All the above is user-defined

More info @ :

http://indico.cern.ch/getFile.py/access?contribId=78&sessionId=5&resId=1&materialId=slides&confId=7108

The Cuts

- Predefined sets of cuts are available with CORRFW
  - *1: MC-level cuts*
    - kinematics, charge, PDG code, primary/secondary...
  - *2: acceptance-level cuts*
    - # track references per detector
  - *3: reconstruction-level cuts*
    - kinematics, charge, refits in detectors, covariance matrix...
  - *4: PID-level cuts*
    - PID response per detector, combined PID
- Cut classes can be extended
  - *more cuts can be added in the repository according to user requirements*
  - *users can define and use their own private cuts*
- QA histograms support provided
  - *flag to set if QA histos needed*
  - *can be used to monitor which cuts "cut" more...*

How to start ?

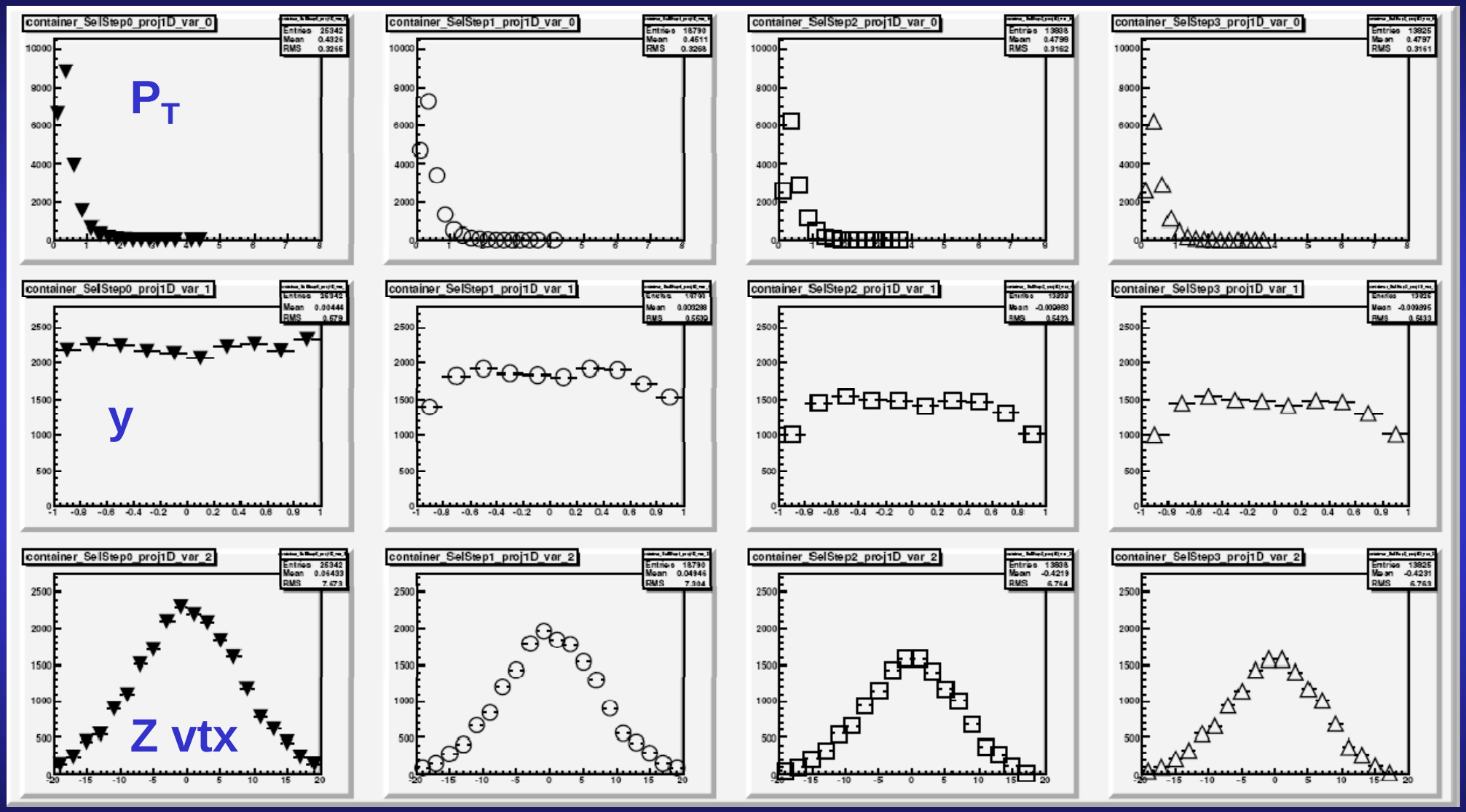
- → $ALICE_ROOT/CORRFW/test
  - *example macros and template analysis tasks :*
    - single track analysis
    - 2-body decay analysis (V0 and resonance)
  - *documentation CF_DOC.pdf*
- available from AliRoot branch >= v4-10
- works on AliEn and... CAF!!

so practically :

```
> cd $ALICE_ROOT
> aliroot -b -q AliCFSingleTrackTask.C (or ->
AliCFSingleTrackCAF.C)
```

CAF tests : single particles

primary π in 10^4 pp@14TeV 1D projections of n_vars+1 dimension container



Efficiency maps are calculated a posteriori and using the previously filled container

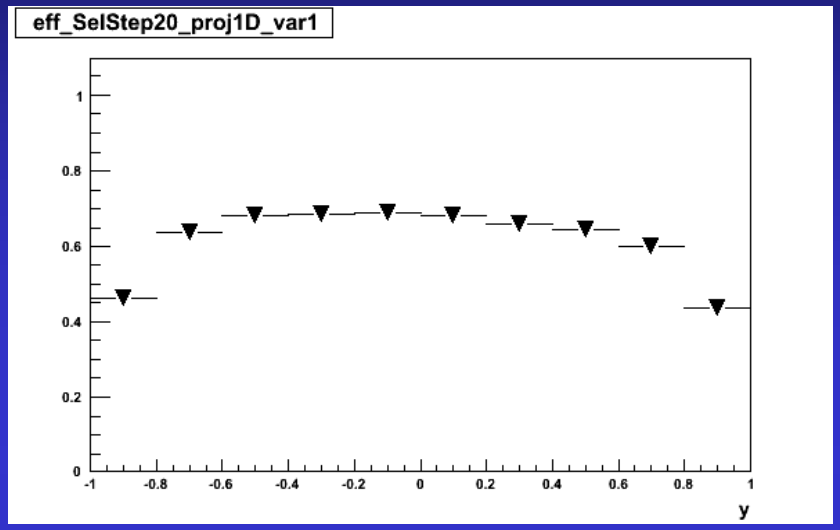
How to do it -> $ALICE_ROOT/CORRFW/test/testCFContainers.C

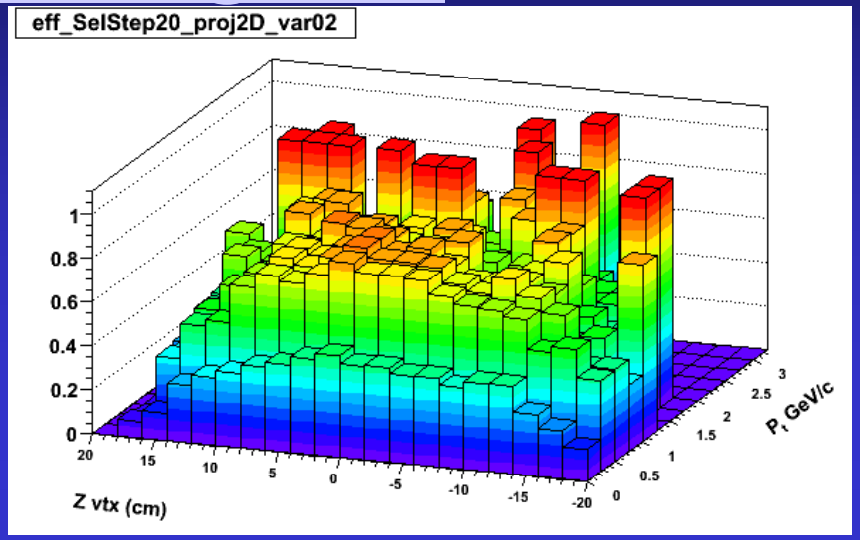
CAF tests : single particles

total efficiency vs y

total efficiency vs p_T-Zvtx

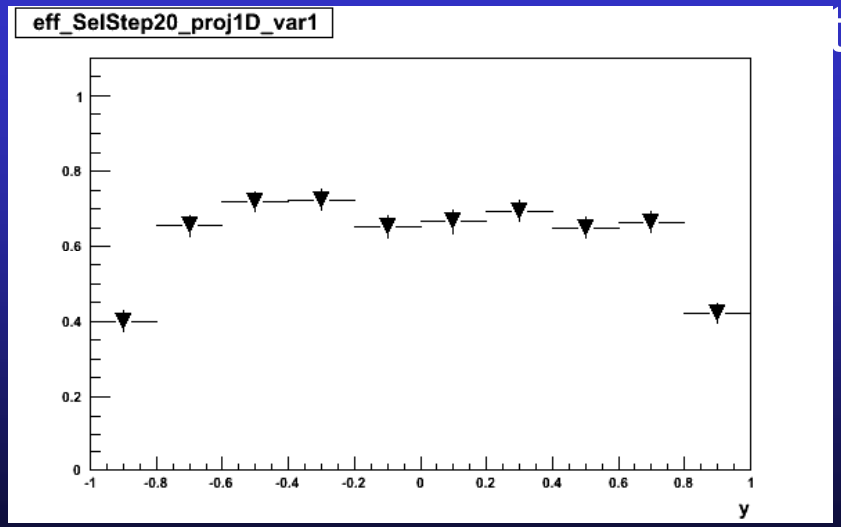
primary π in 10^4 pp events@14TeV

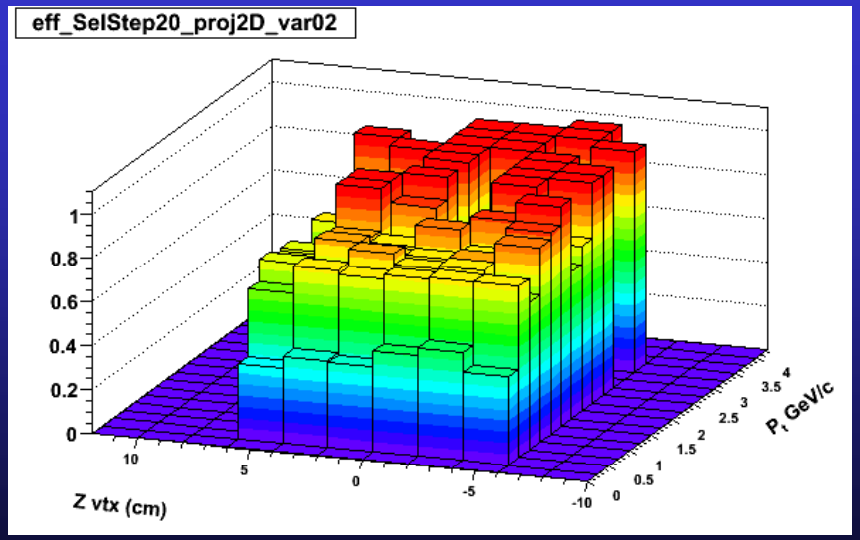




primary p, in 13 PbPb

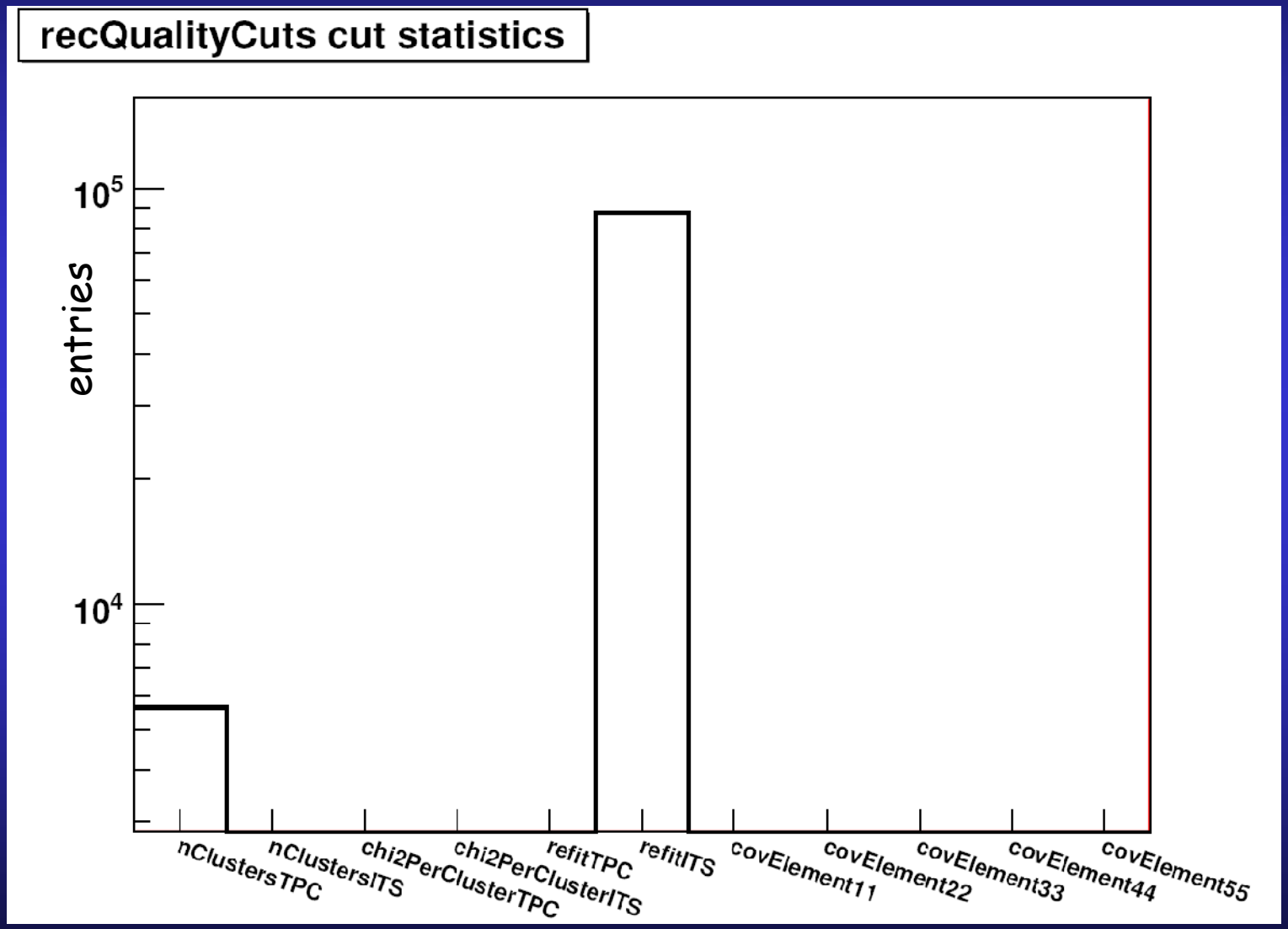
ts





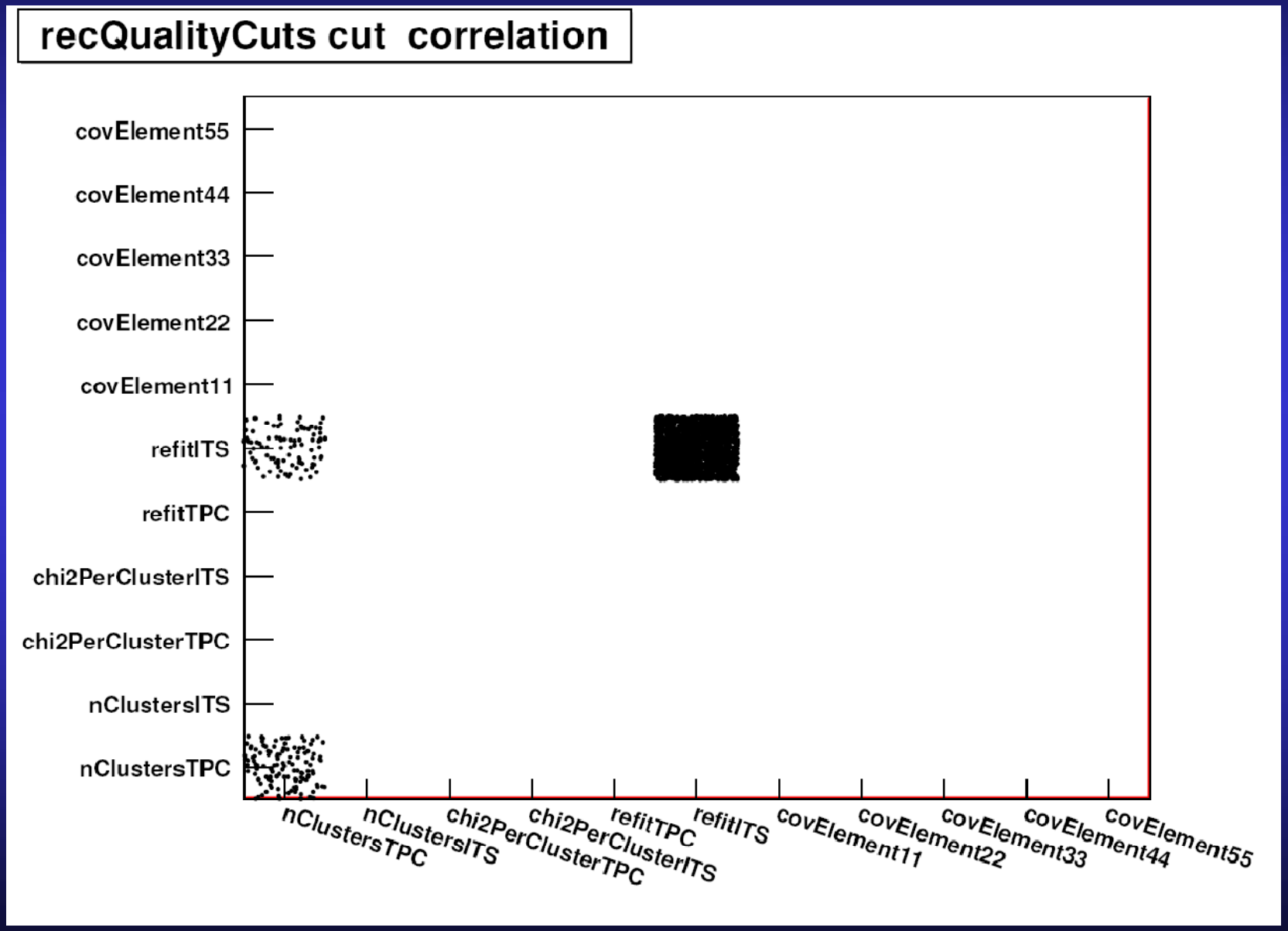
CAF tests : single particle QA histo example 1

primary π in 10^4 pp@14TeV



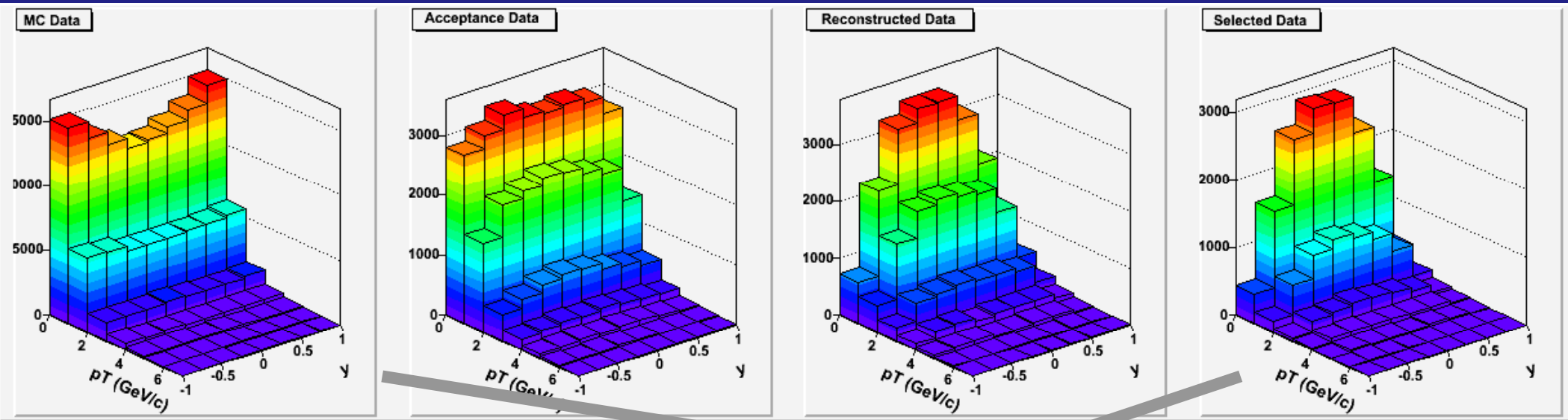
CAF tests : single particle QA histo example 2

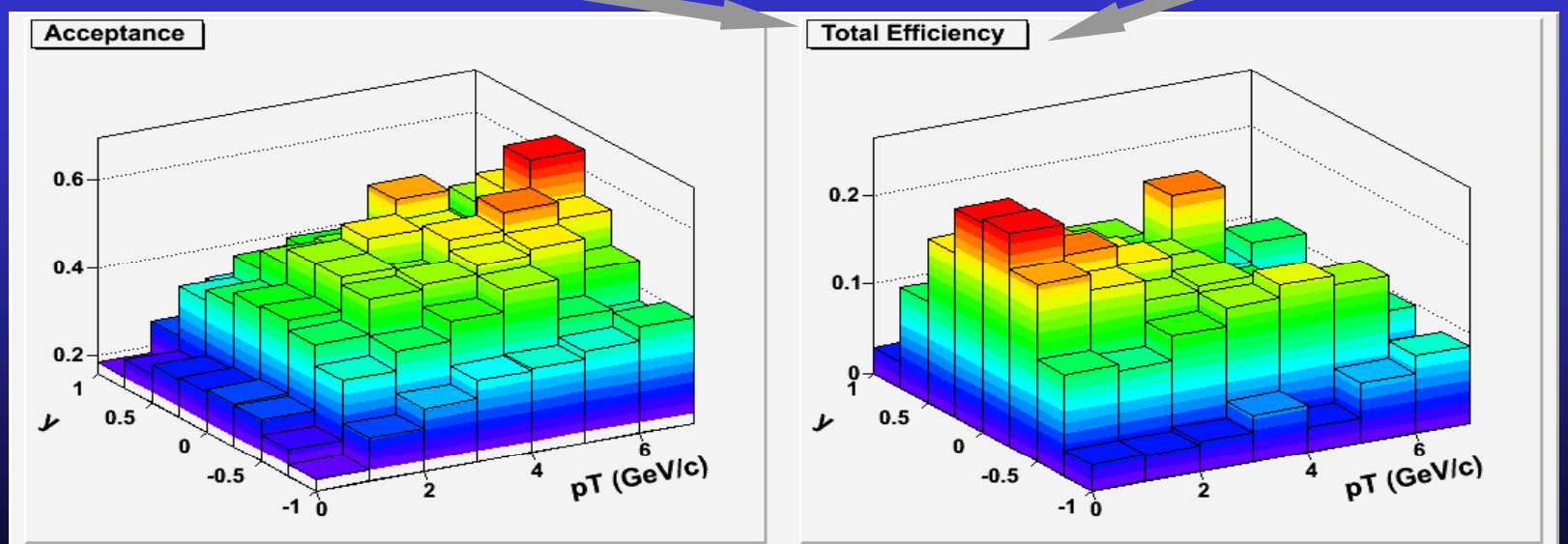
primary π in 10^4 pp@14TeV



Tests : 2-body decays

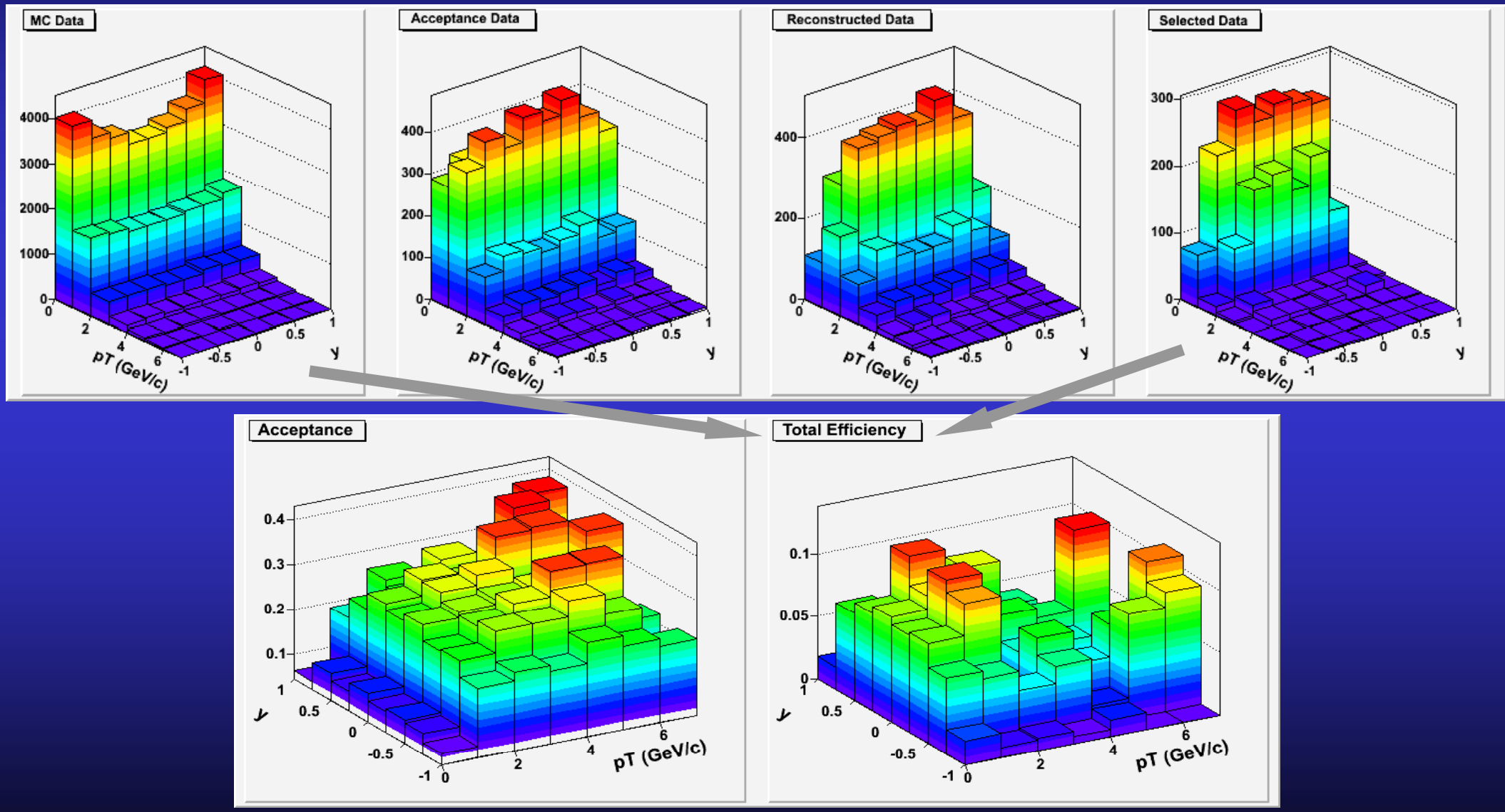
- $K^0(892) \longrightarrow \pi K$, AliEn, 730 K pp@14TeV
  - ***(p_T,y) spectra for 4 selection steps***





Tests : 2-body decays

- $\Phi(1020) \rightarrow K^+K^-$, AliEn, 720 K pp@14TeV
  - *(p_T,y) spectra for 4 selection steps*



News and current problems

QA histograms support on CAF is now available

- *it now works, thanks to A. Gheata who provided a fix!*
- *but still problems with TH1 streaming on proof*
  - **=> make rather heavy constraints on the whole code architecture**
  - **=> make the cut classes implementations more complex**
  - **[this is however transparent for users...]**
- *a lot of work has been dedicated to solve this issue, with no success*
- *comments from aliroot core team appreciated*

AliCFContainer (corr map) + related classes still a 100% adhoc-developed

- *transition to ROOT's THnSparse expected soon*

Accessing clusters will be possible

- *nice for more realistic acceptance calculation (only track references so far) !*

Status and to-do...

- Tests on different systems (pp/PbPb) OK
- Tests on AliEn + CAF OK
- AliAnalysisTaskSE done, to test
- QA histograms partly (60%)
- Support for AOD partly (40%)
- THnSparse-compliance to do
- Increase code velocity to do

- Handle special track refs. for MUON to do
- Acceptance calculation with clusters to do

….many thanks to Renaud for the slides!

Input from detector/tracking people and PWGs

Some selection detail:

- Acceptance selections for single particle:

- mcAccCuts->SetMinNHitITS(mintrackrefsITS); mintrackrefsITS = 3

- mcAccCuts->SetMinNHitTPC(mintrackrefsTPC); mintrackrefsTPC = 2

- Track Quality and IsPrimary selections for single particle:

- recQualityCuts->SetMinNClusterTPC(minclustersTPC); minclustersTPC = 50

- recQualityCuts->SetRequireITSRefit(kTRUE);

- recIsPrimaryCuts->SetMaxNSigmaToVertex(3);