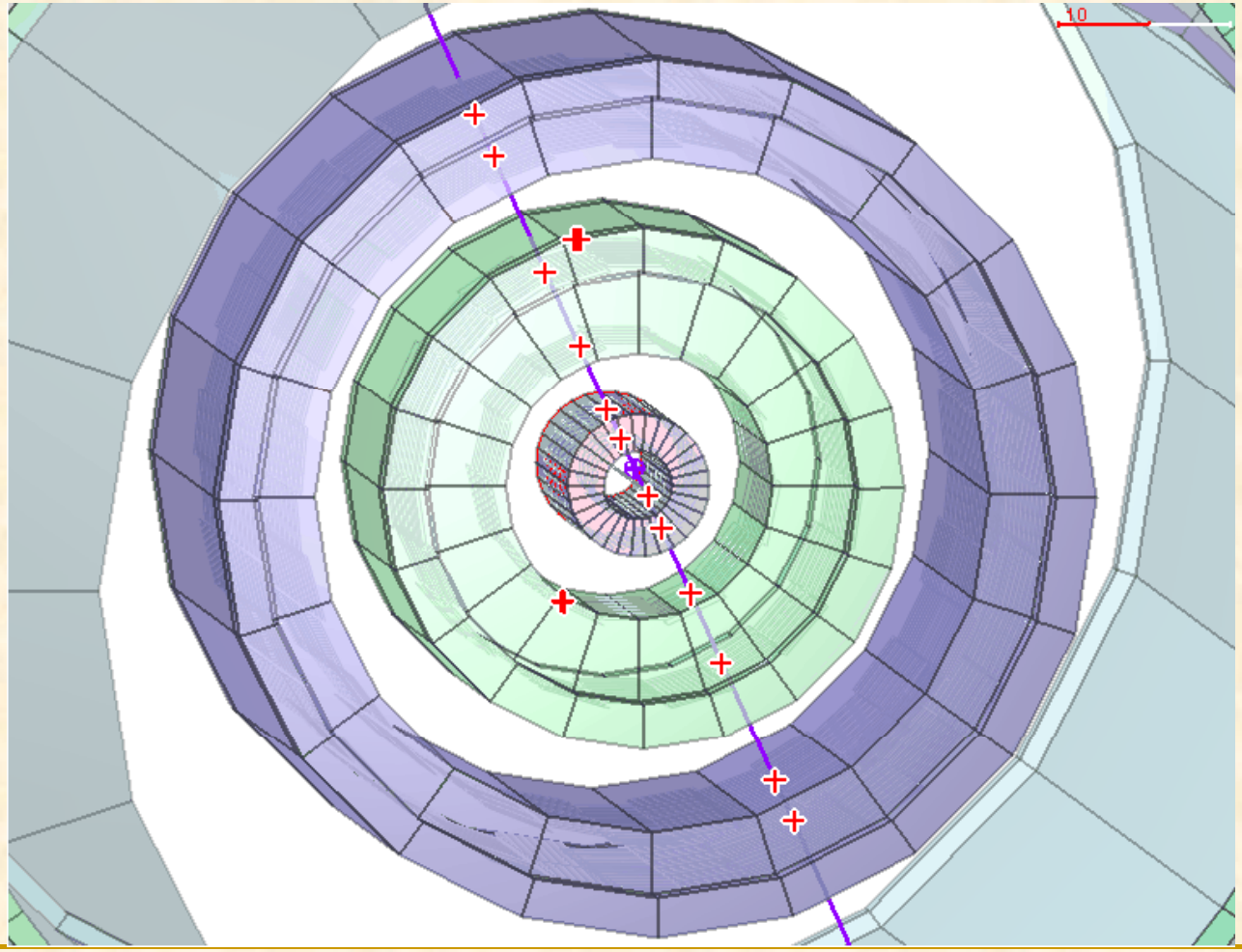
Recollection of the V plot story + few news from the task progress



Preliminary remarks

- Quite old(ish) story – started from a non-formal meeting with Hans Drevermann in 2005
- DALI - memorable display package heritage
- V PLOT's main goal – to code 3D information into a 2D plot (more human friendly one)
- A price to pay – need of a "key" in order to interpret the V plot
- Few (my) historical slides (April 2005 !) first

Beginning of (few) *historical* slides

First Physics Meeting (alias p p)

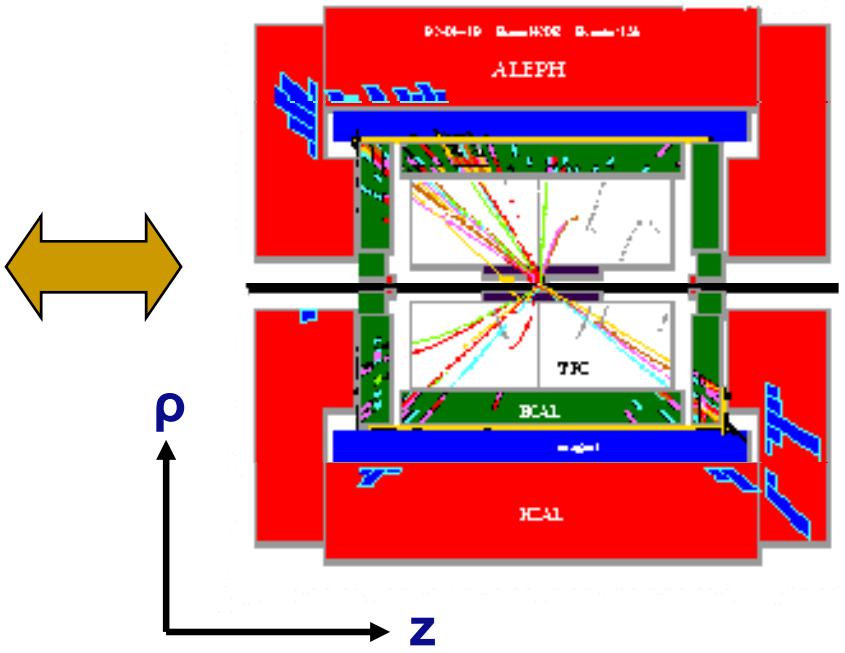
April 2005

INVENTING PERTINENT DIAGNOSTIC TOOLS – a huge task given complexity of ALICE

→ Looking for global ways of data projections as checks of alignment and tracking , talk by Hans Drevermann from ALEPH/ATLAS

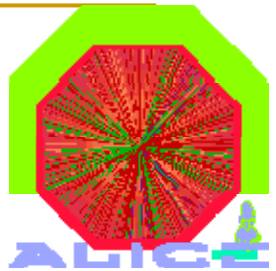
(23 March 2005)

http://ipt.web.cern.ch/IPT/PINS/DALI.html



DALI: *The Aleph Offline Event Display*

DALI was written and is maintained by
H.Drevermann

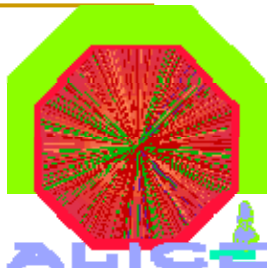


DALI is an event display program based predominantly on special linear and non linear projections of the radial and cylindrical structure of the detector and the event. Special 3D methods are employed that do not rely on conventional 3D smooth rotations. DALI avoids wire frames and minimizes the concept of data reduction to simplify the image. Concepts from cognitive psychology are employed to optimize projections and coloring.

•Brief description
•Papers about event displays:
Event Display: Can We See What We Want to See?
Is there a future for Event Display?
•Pictures of Aleph events:
The DALI picture database (+cset) contains more than 1000 pictures, all in gif and in ps format.
Annotated examples of different kinds of Z decay.
A selection of the first events observed in Aleph at 130 GeV, 140 GeV, 161 GeV, 172 GeV, 183 GeV, 189 GeV, 19x GeV and 200 GeV

The Feynman – Tuft's Principle:

A visual display of data should be simple enough to fit on the side of a van

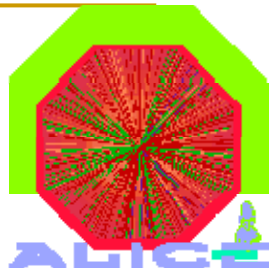


Edward R. Tuft (the da Vinci of data) →

Information displays should be

- documentary
- comparative
- causal and explanatory
- quantified
- multivariate
- exploratory
- skeptical

SPIRAL READER – automatic finding and measurement of the BC tracks



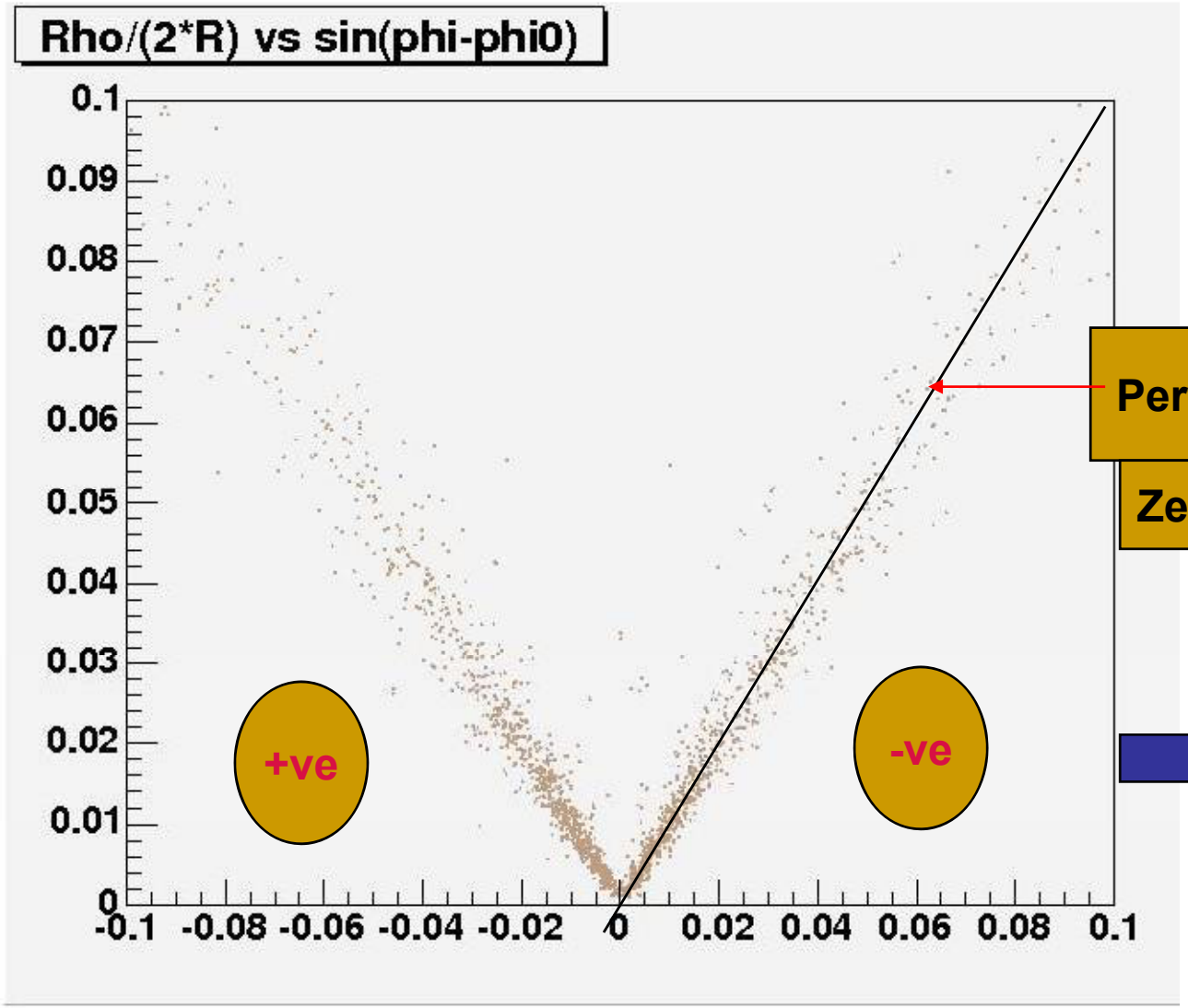
European Spiral Reader Symposium
Stockholm, May 30 – June 1, 1972

The constituent digitizings for the candidates ..are found by mean of a routine in machine language and a linear fit of the equation:

$$\varphi = \varphi_0 + \alpha * \rho + \beta / \rho + \gamma * \rho^3$$

is tried on them by a least squares method

UNIVERSAL PLOT(p alias R known)

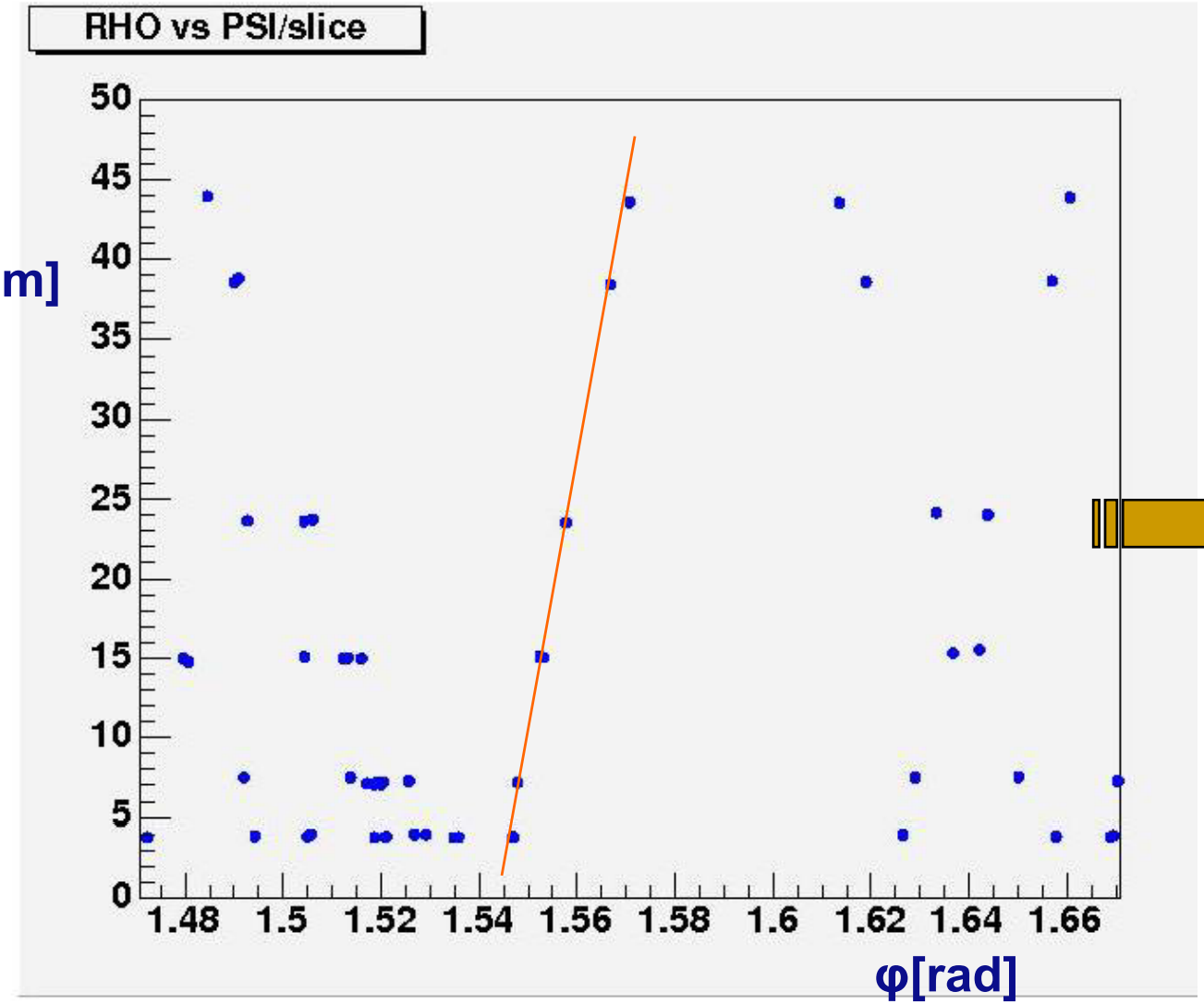


Perfect circles

Zero impacts

global view of tracks quality

RHO-PHI slice zoom



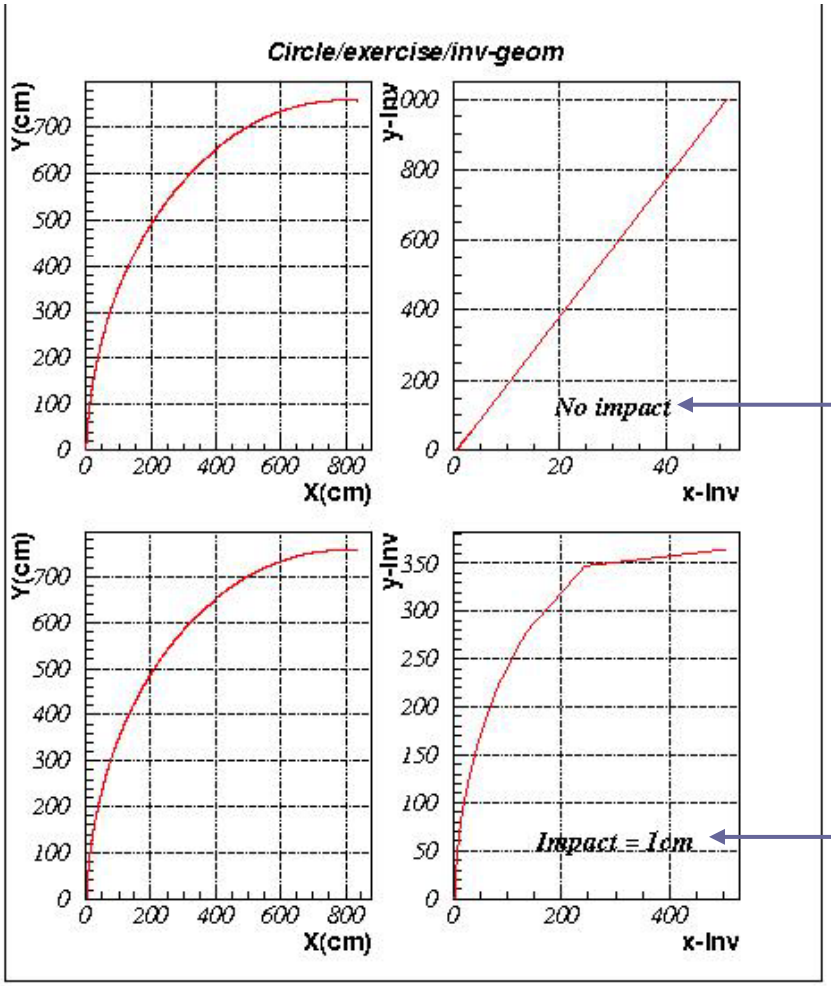
fairly straight tracks

INVERSE GEOMETRY TRANSFORMATION

(Conformal mapping)

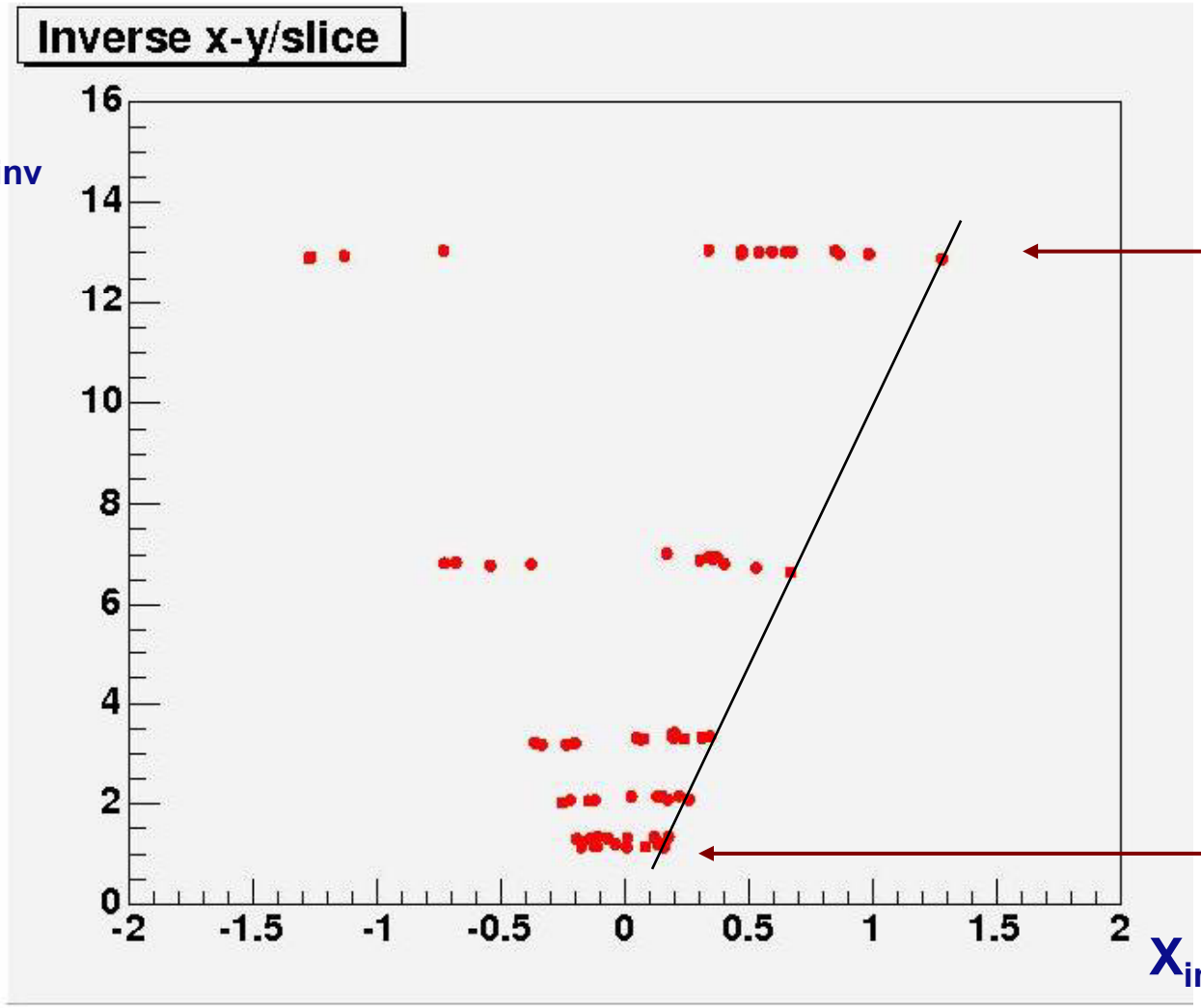
$$x_{inv} = C * \frac{x}{x^2 + y^2}$$

$$y_{inv} = C * \frac{y}{x^2 + y^2}$$

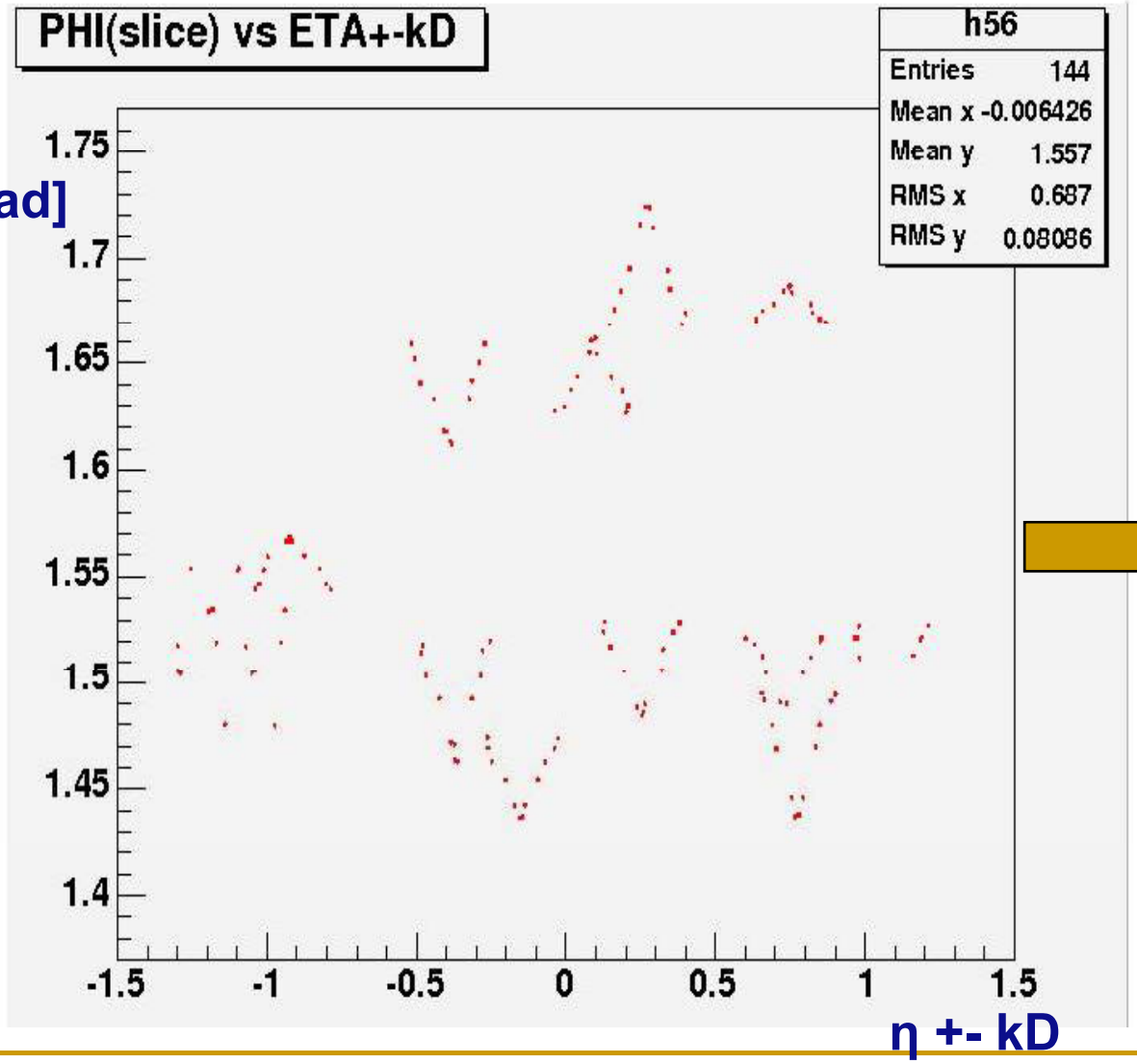


some sensitivity to the impact parameter

PHI SLICE in INVERSE GEOMETRY



V (not V^0 !) track representation

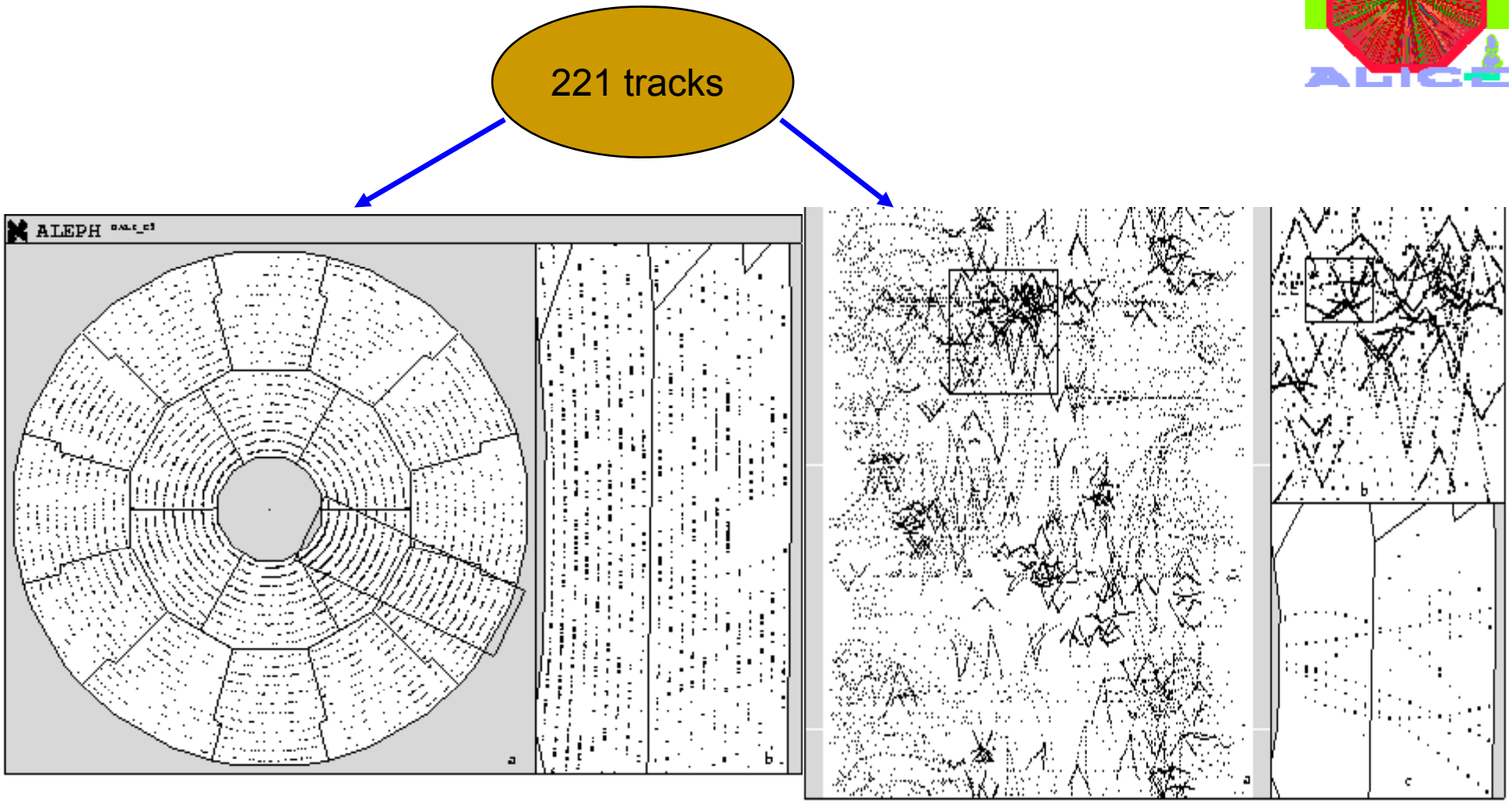


η – pseudo-rapidity
k - a constant
D - $| \rho - \rho_{max} |$

track diagnostics

(simple design, intense content)

An (artificial pileup) *high* multiplicity ALEPH event



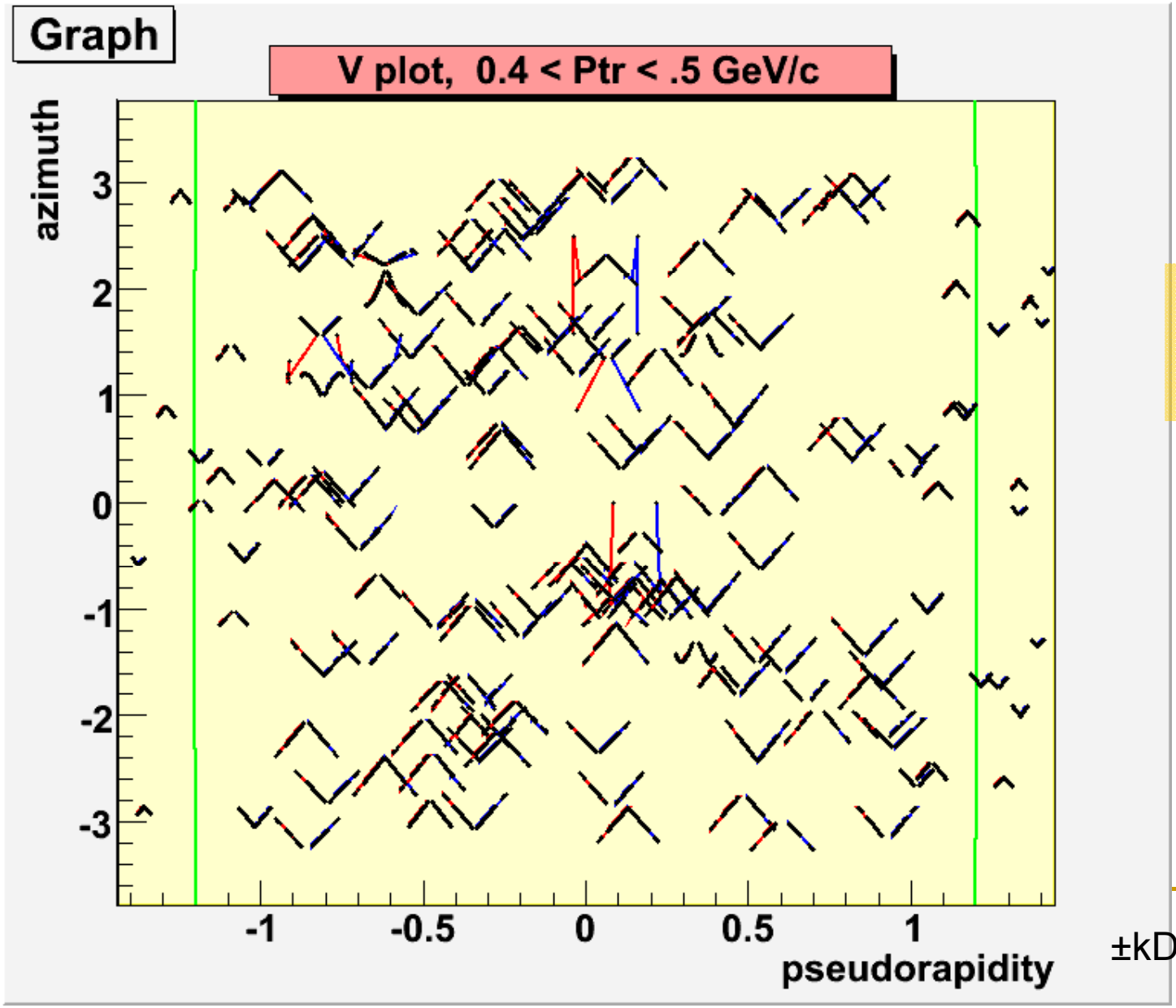
End of historical slides

New look at the V plot
+implementation

Practical implementation problems and *ad hoc* solutions

- **AliTrackPointArray of TPC tracks extracted from AliESDfriend:**
  - **N of points does not correspond always to the content (corrupted points ?)**
- **Use only good tracks (N of points > 50) to start**
- **Phi continuation across the "boundary" (+π,-π)**
- **Main vertex placed at (0,0,0) for simplicity, particles generated (genbox) in pseudorapidity range (-2,+2)**
- **Constant k in η+-kD fixed to 0.0004, η extracted from particle (true) momentum at the main vertex**

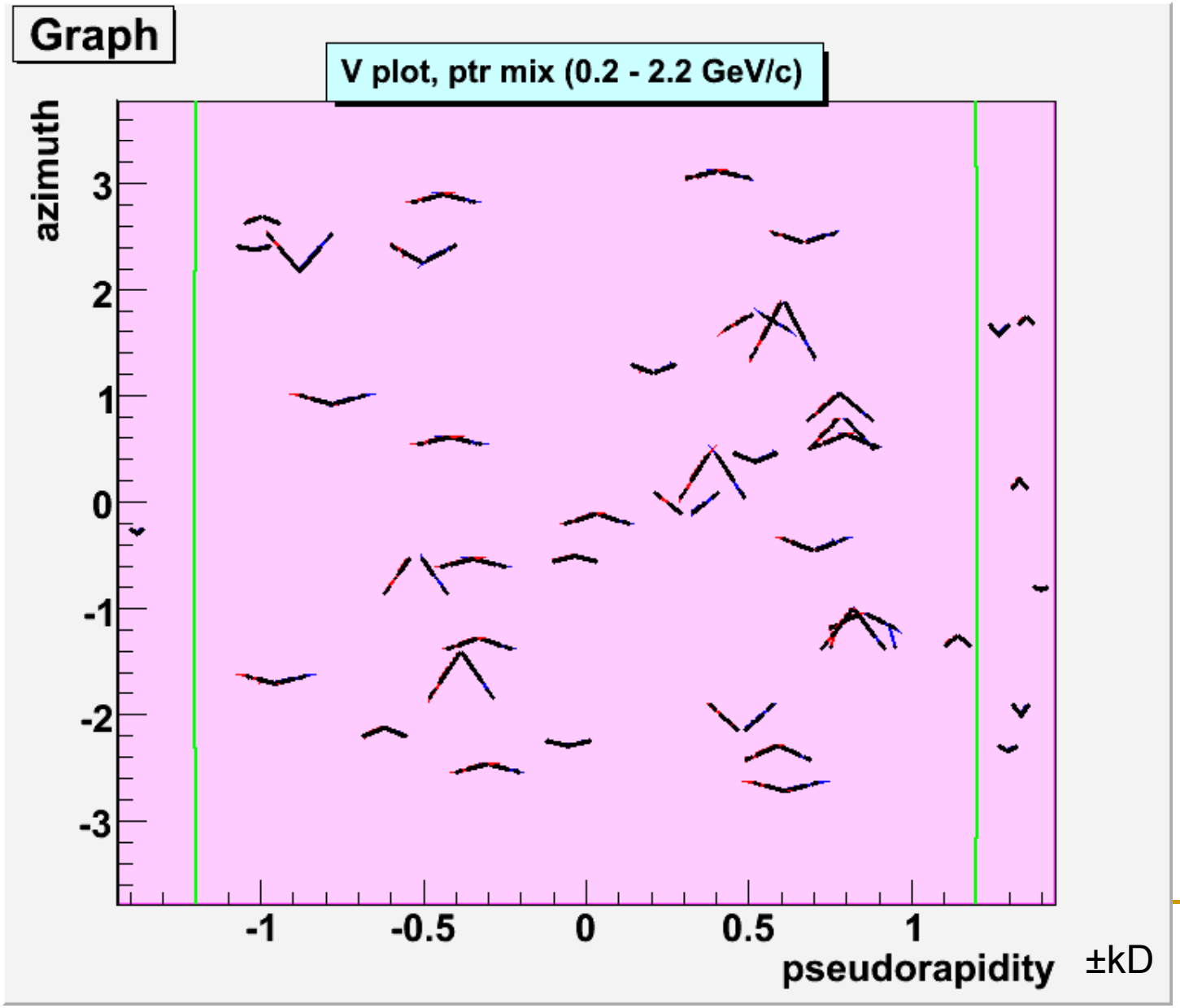
Example 1 – limited momentum range



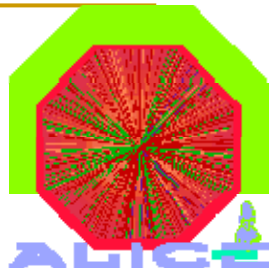
Colored lines – joining badly assigned clusters

±kD

Example 2 – mixture of momenta



Some keys to “read” the plots



- Missing apex – track ends before reaching ρ-max
- Angle of V (or phi range spanned) – measure of momentum
- V or Λ depending on particle sign
- Distorted lines – track not coming from the primary vertex
- Some extra (color) lines – strange clusters attached to a track: bad reconstruction or errors in AliTrackPointArray (some big jumps in phi already removed !)

THAT is ALL for NOW – THANKS !

ALICE coordinates

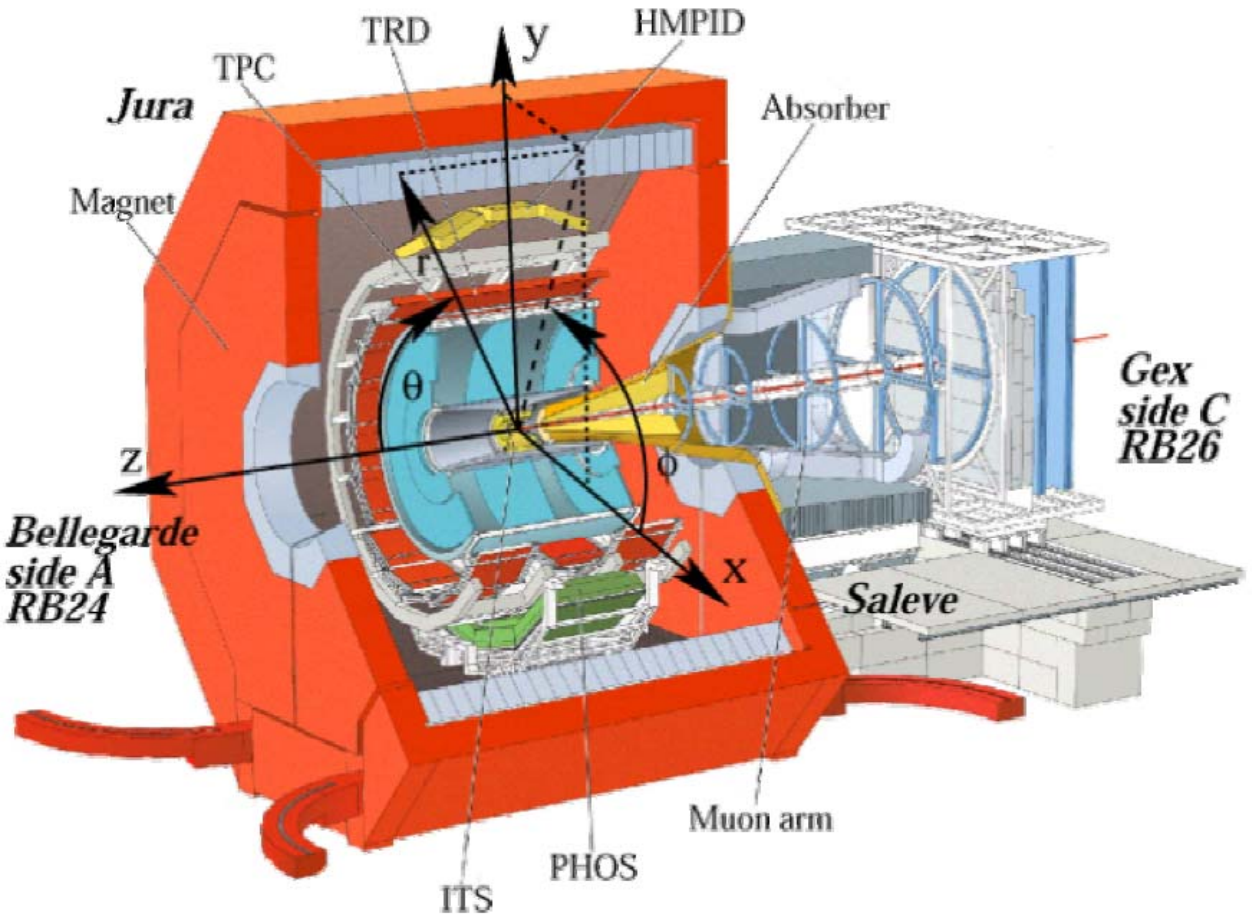


Fig1. Definition of the ALICE coordinate system axis, angles and detector sides.