

# Atlantis tutorial-2

Nikos Konstantinidis (UCL),

Zdenek Maxa (UCL),

Charles Timmermans (NIKHEF/RU Nijmegen)

# Analysis Techniques

Data to be viewed may be

**Cut** - e.g. by pT, energy, association...

**Colored** - by associations, layer, sub-detector, pT, energy

more powerful when used in **combination**

e.g. selected only hits belonging to kine tracks

and color them by their associated reconstructed track

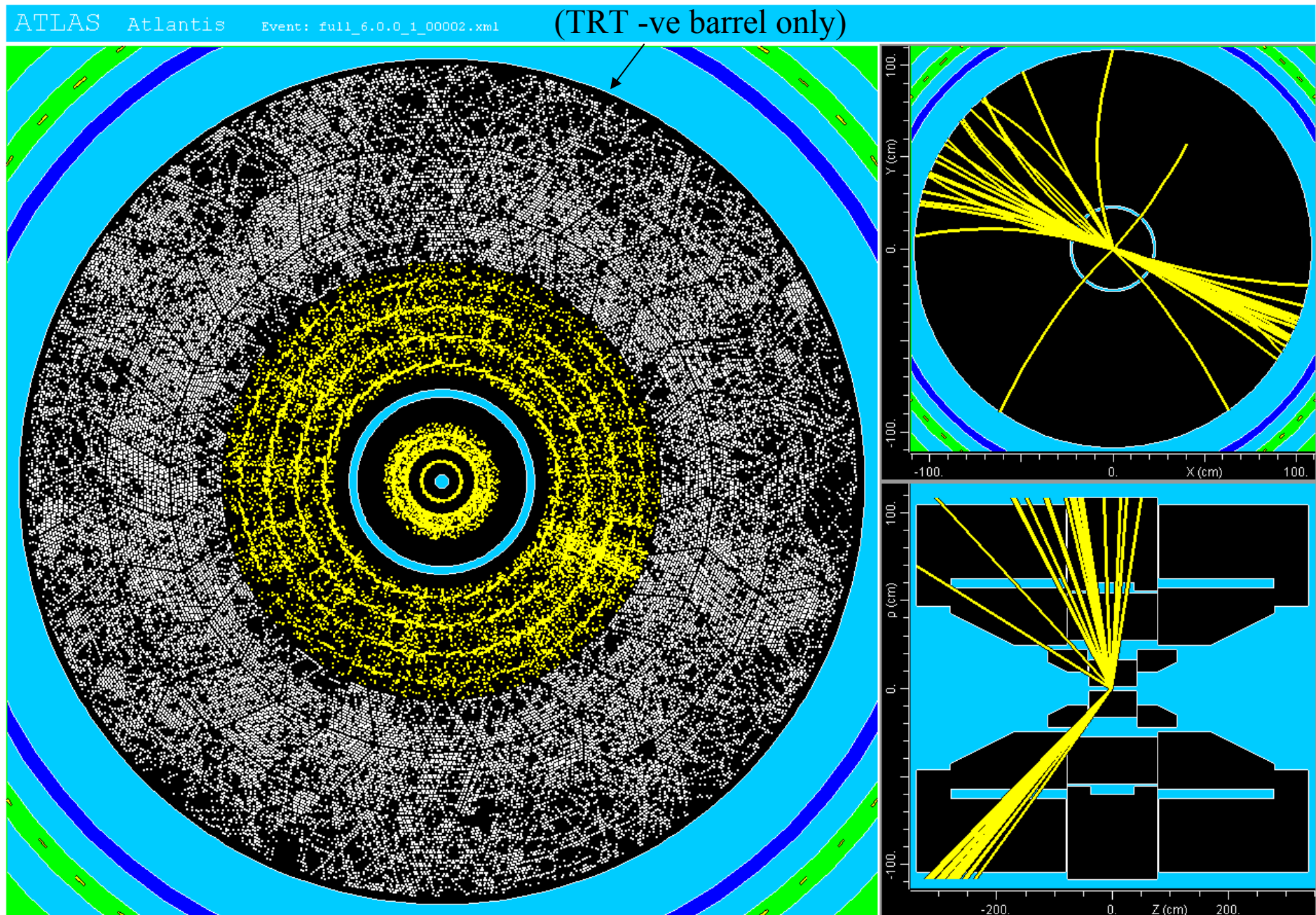
( inconsistencies indicate problems)

**Superimposed** – iPatRec tracks over true tracks

Check track reconstruction in **difficult** design luminosity event

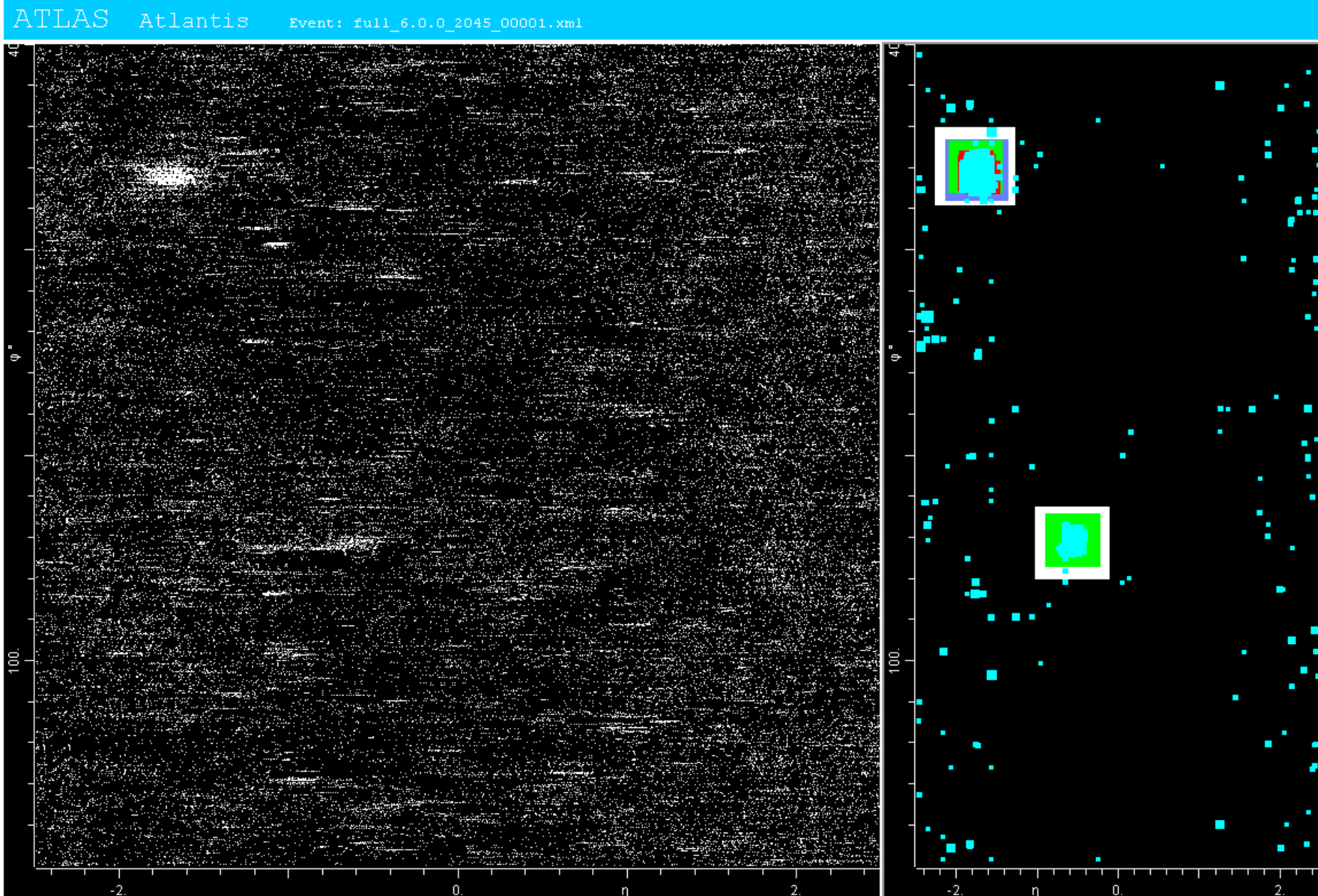
- Selected event has two high  $p_t$  ( $>560\text{GeV}$ ) jets ( DC1dataset 2045)
- Luminosity  $10^{34}$
- Silicon space points 27,000
- TRT hits 240,000
- Reconstructed tracks 120
- Reconstructed in 20 minutes

# 2D projections of Inner Detector data not very useful at design luminosity



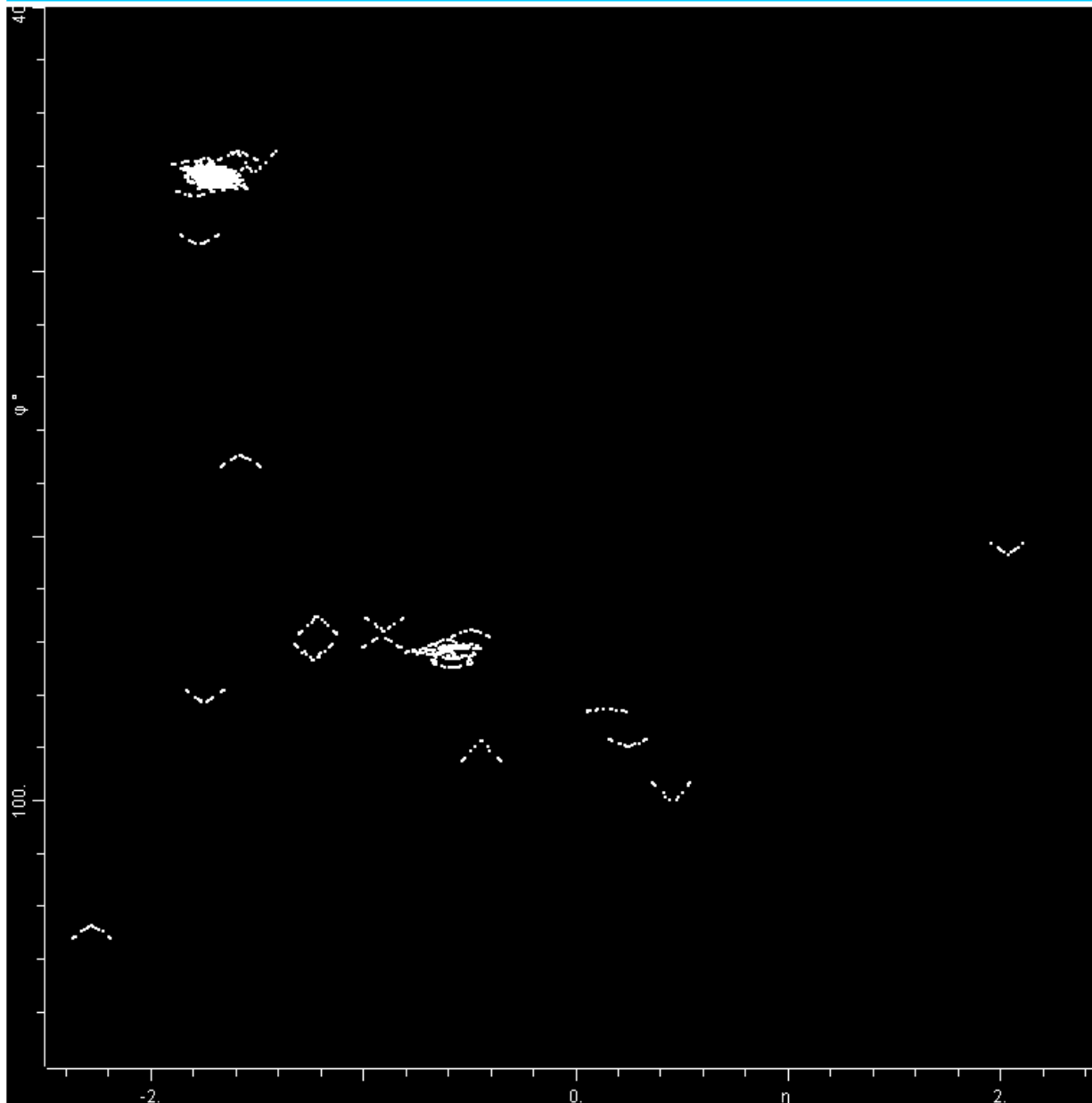
# V-Plot silicon space points

# $\Phi\eta$ calorimeters



# Filtering of space points available inside Atlantis

ATLAS Atlantis Event: full\_6.0.0\_2045\_00001.xml



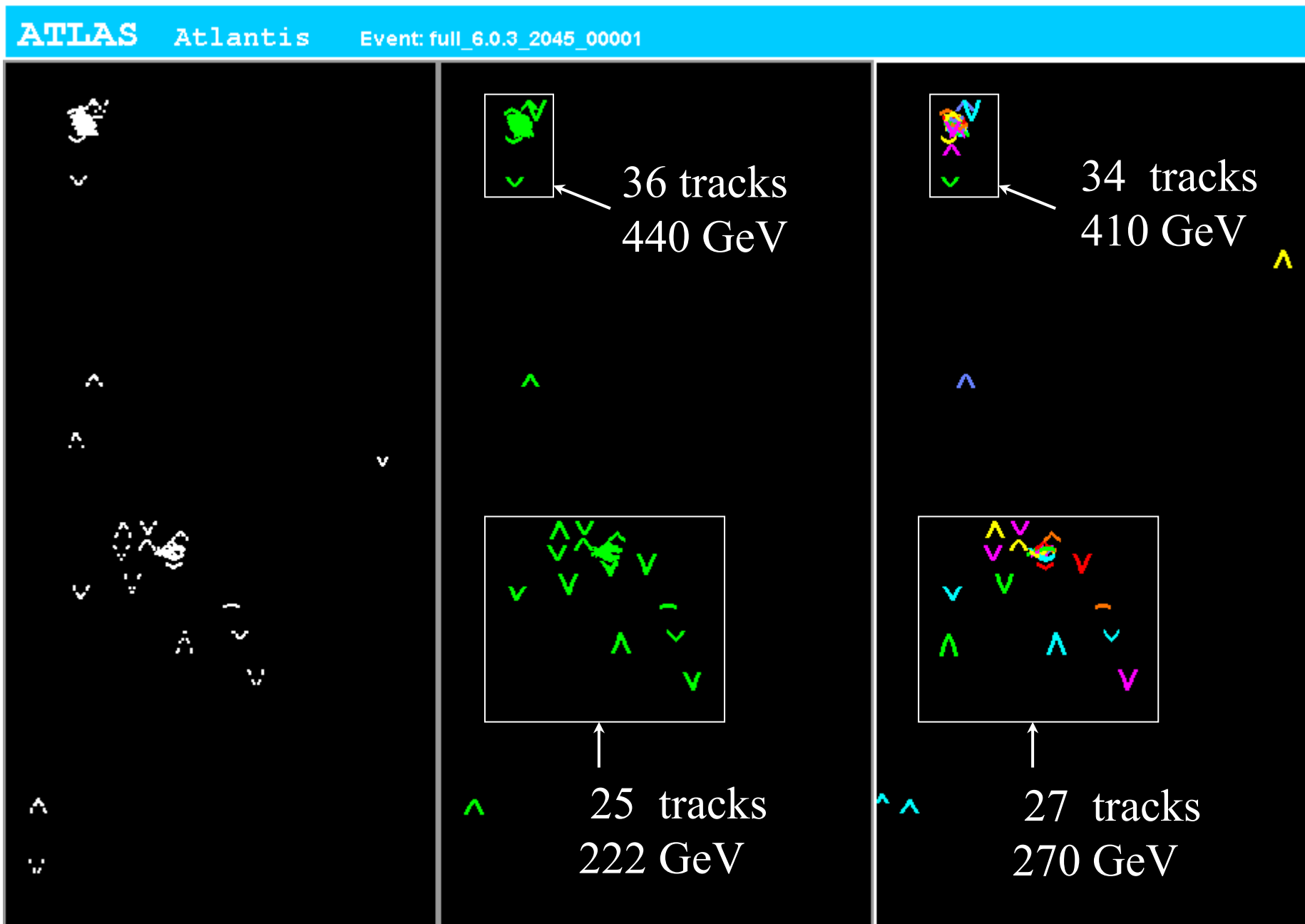
Filter space points with a histogram based technique which selects hits consistent with tracks originating from the primary vertex.

Time = 1 sec/event

# Filtered hits

# iPatRec tracks

# True tracks



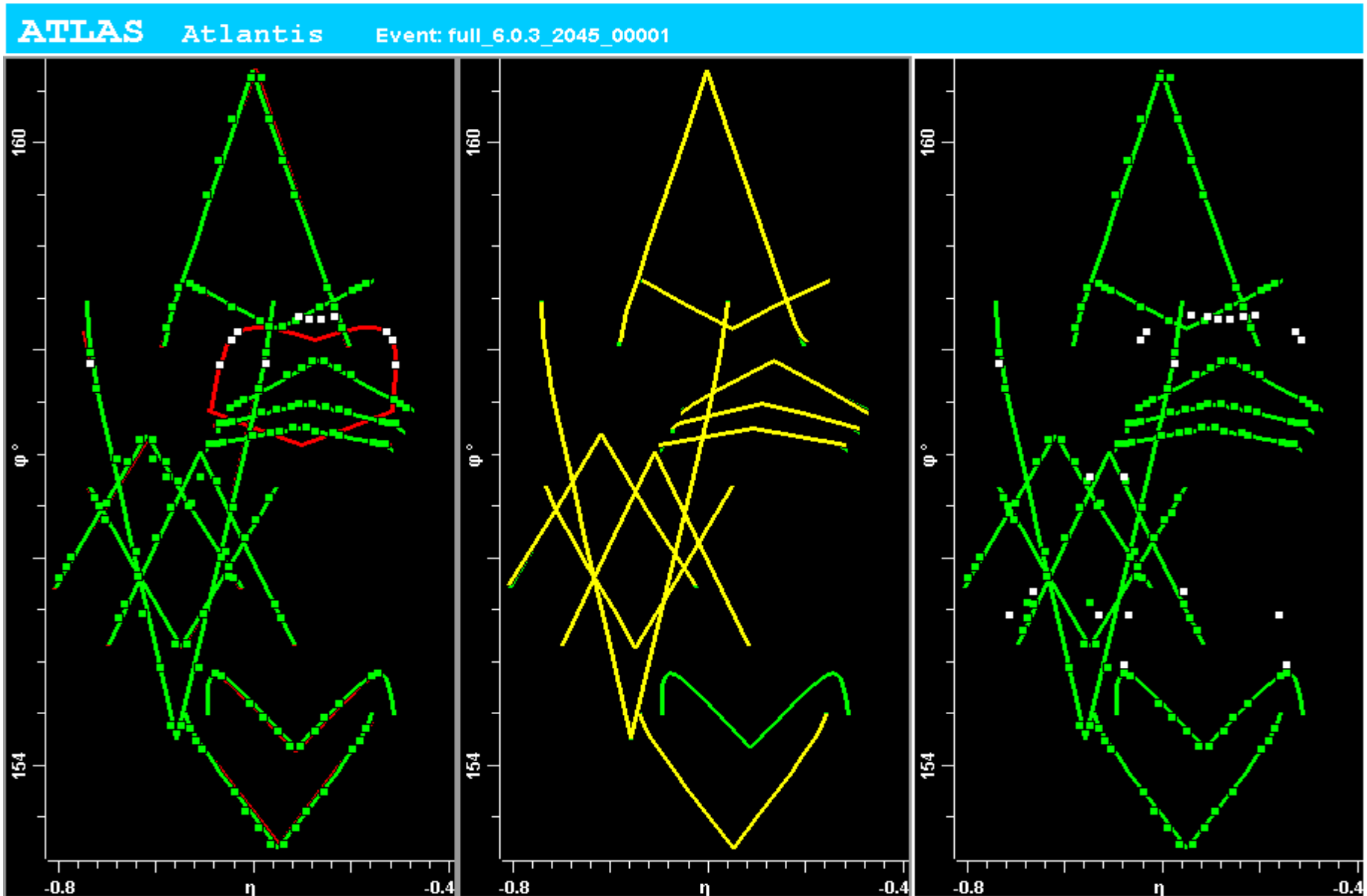


# Tracks lost in core of central jet

STr,iPat,S3D(STr,iPat)

iPat, xKal

iPat,S3D(Filter,iPat)





# Lists

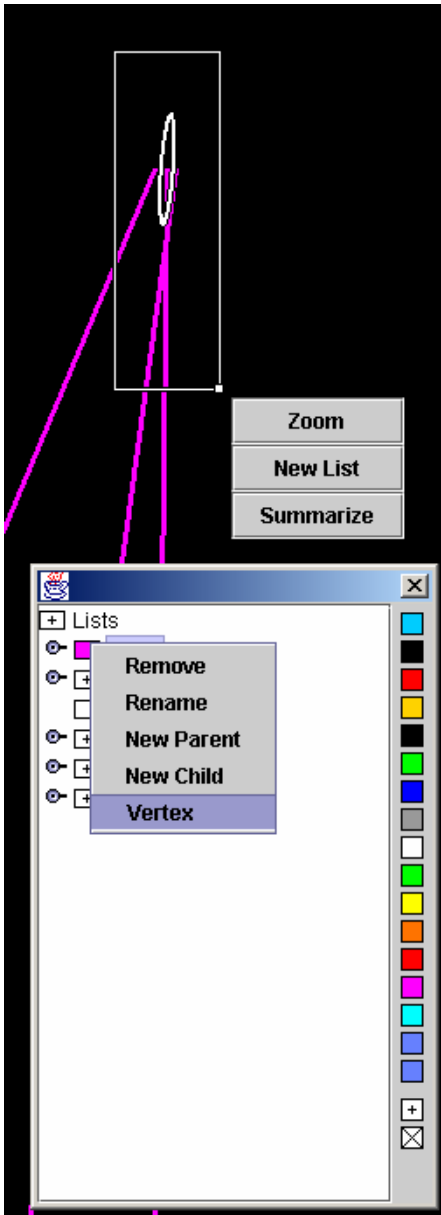
Up till now we have seen how to investigate data and association present on the input file.

Lists allow user to dynamically create and manage their own associations

grouping of object

perform context dependent operations

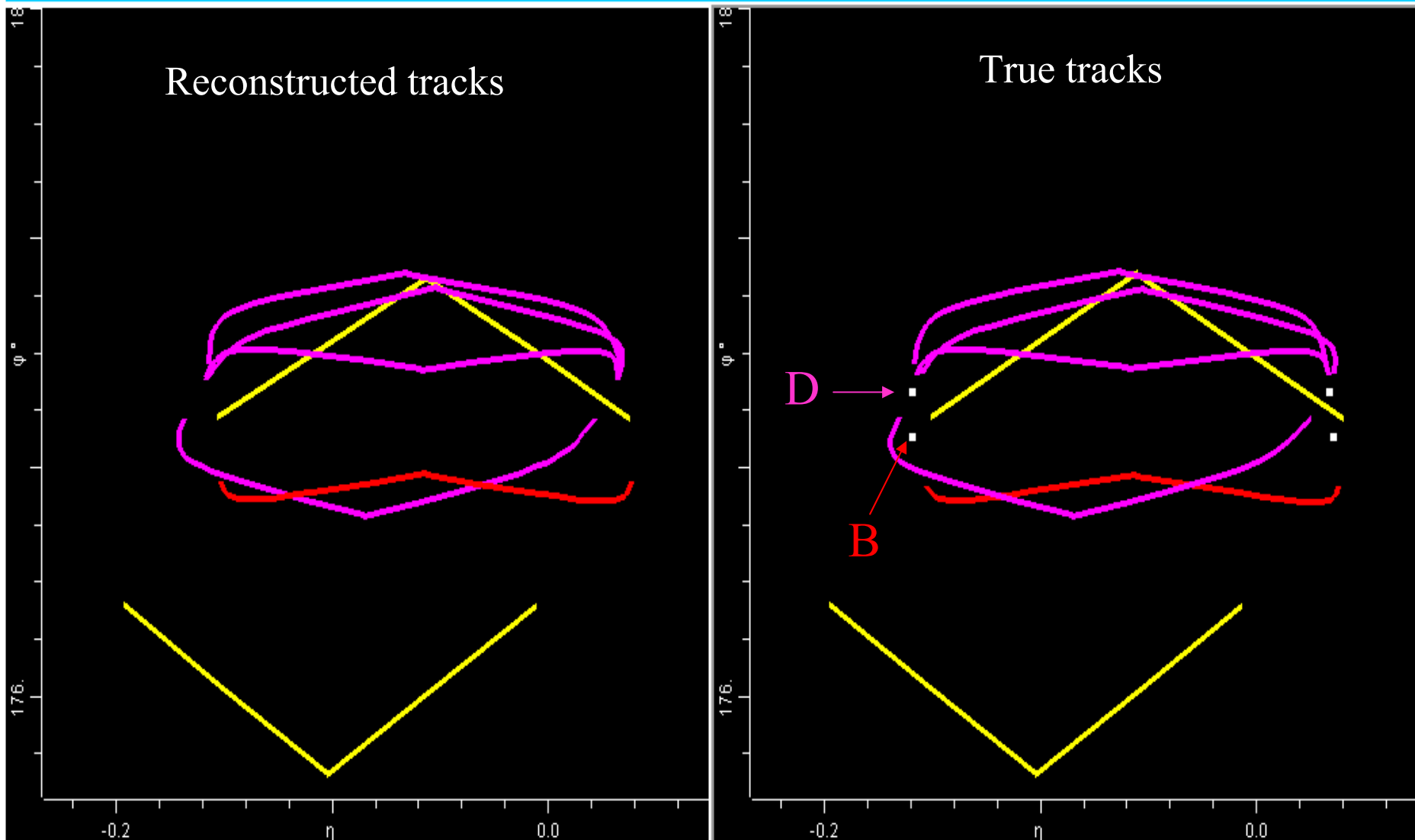
e.g. vertex a set of reconstructed tracks



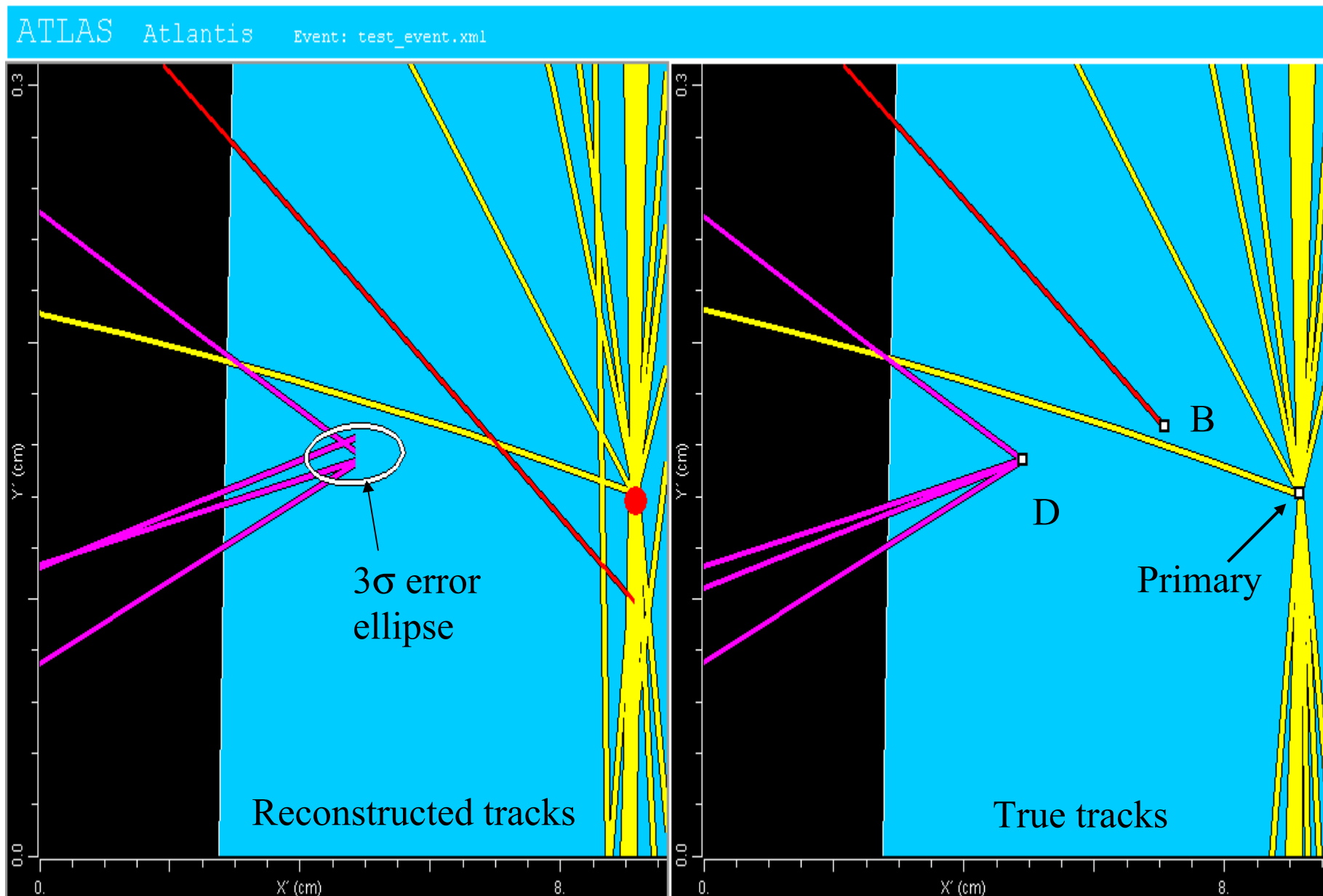
# Identifying secondary vertices

Look for a group of nearby kinked V's in the VPlot

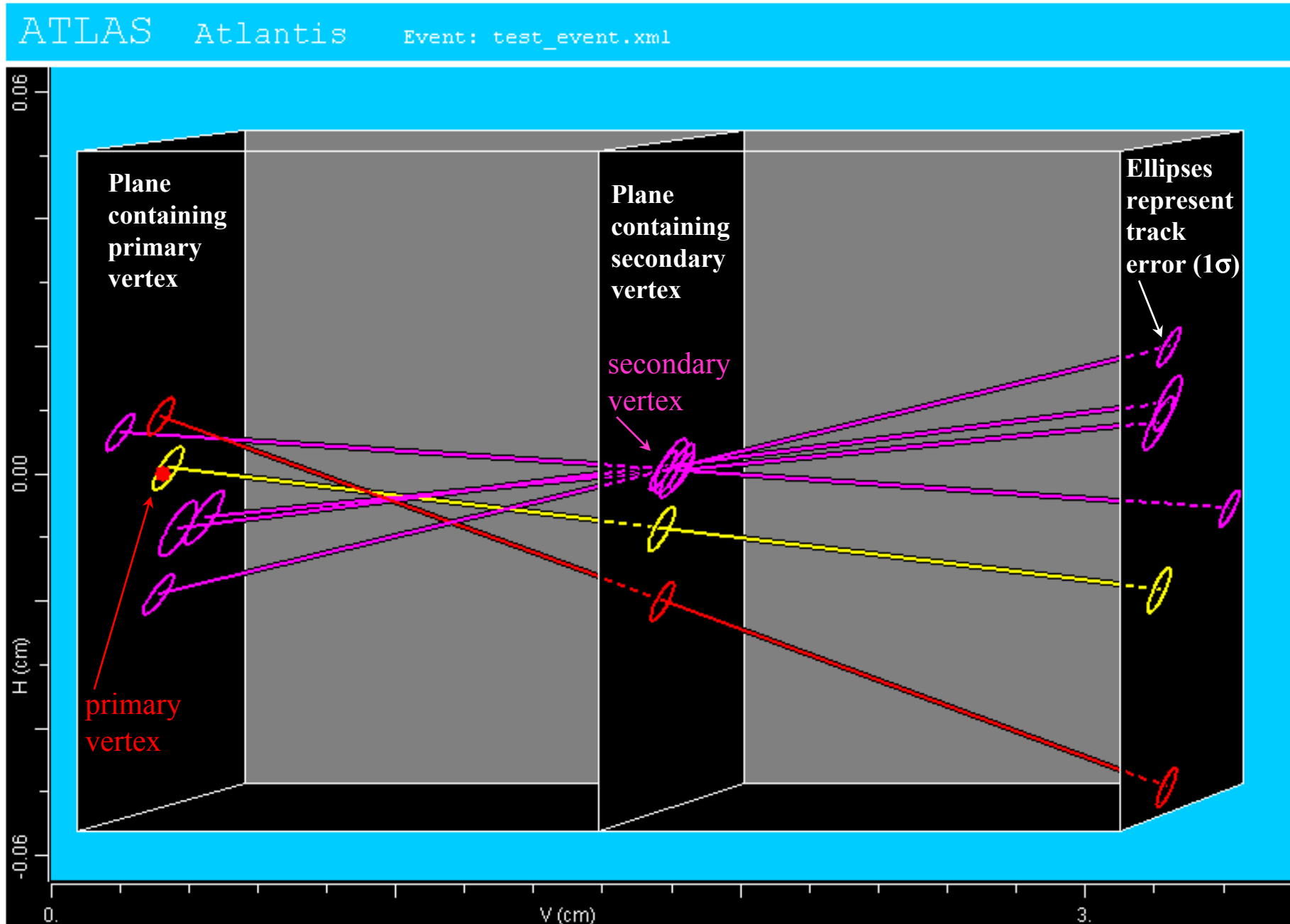
ATLAS Atlantis Event: test\_event.xml



# Y/X projection – region around the primary vertex

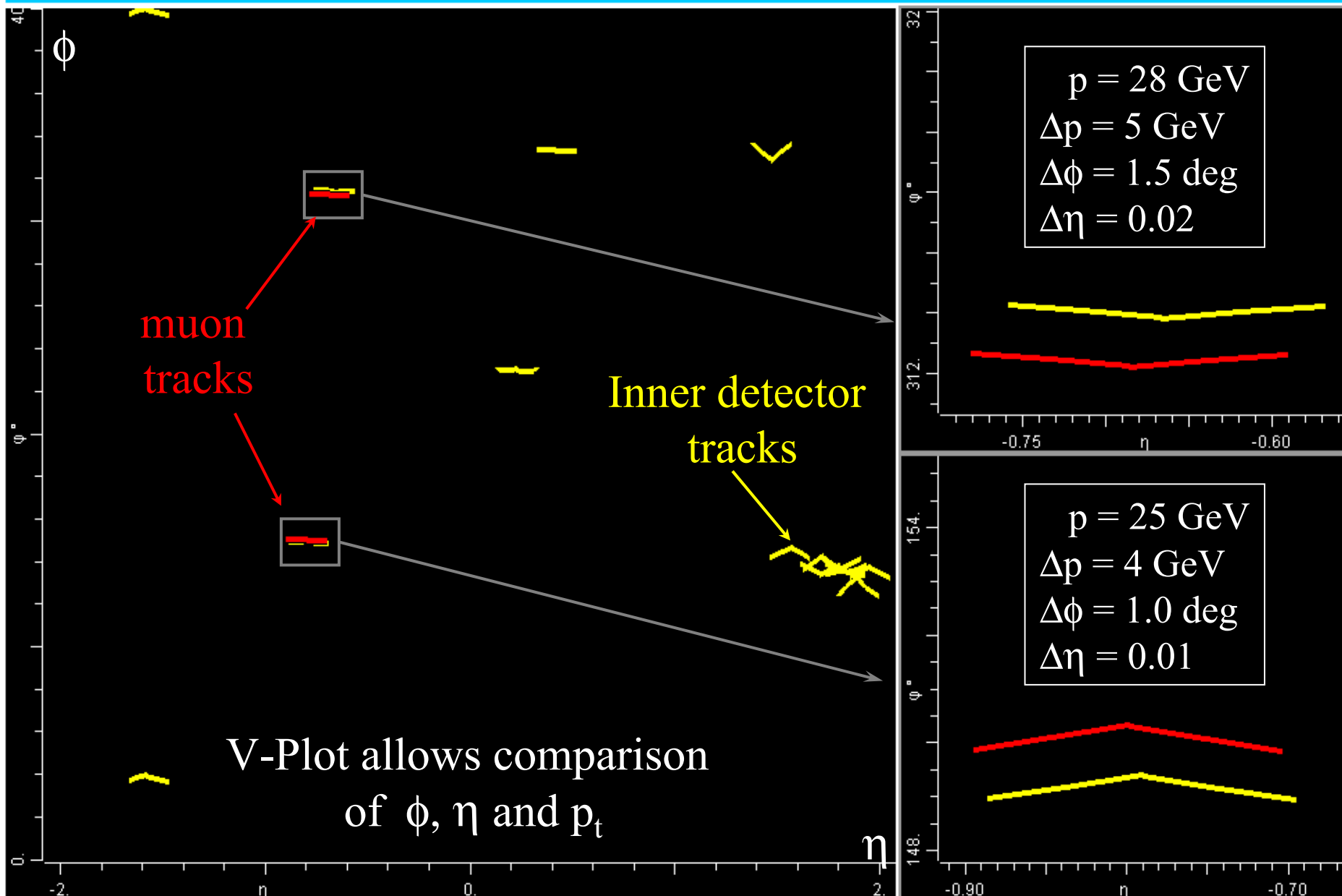


# Secondary vertex region best displayed in abstract 3D Box



# Comparison of muon and inner detector track fits

ATLAS Atlantis Event: full\_5.3.0\_1\_00003.xml



# Cell clustering and Jet reconstruction – AtlFast (DC1- QCD event)

