MUON trigger chambers efficiency and quality with upstream reconstructed tracks

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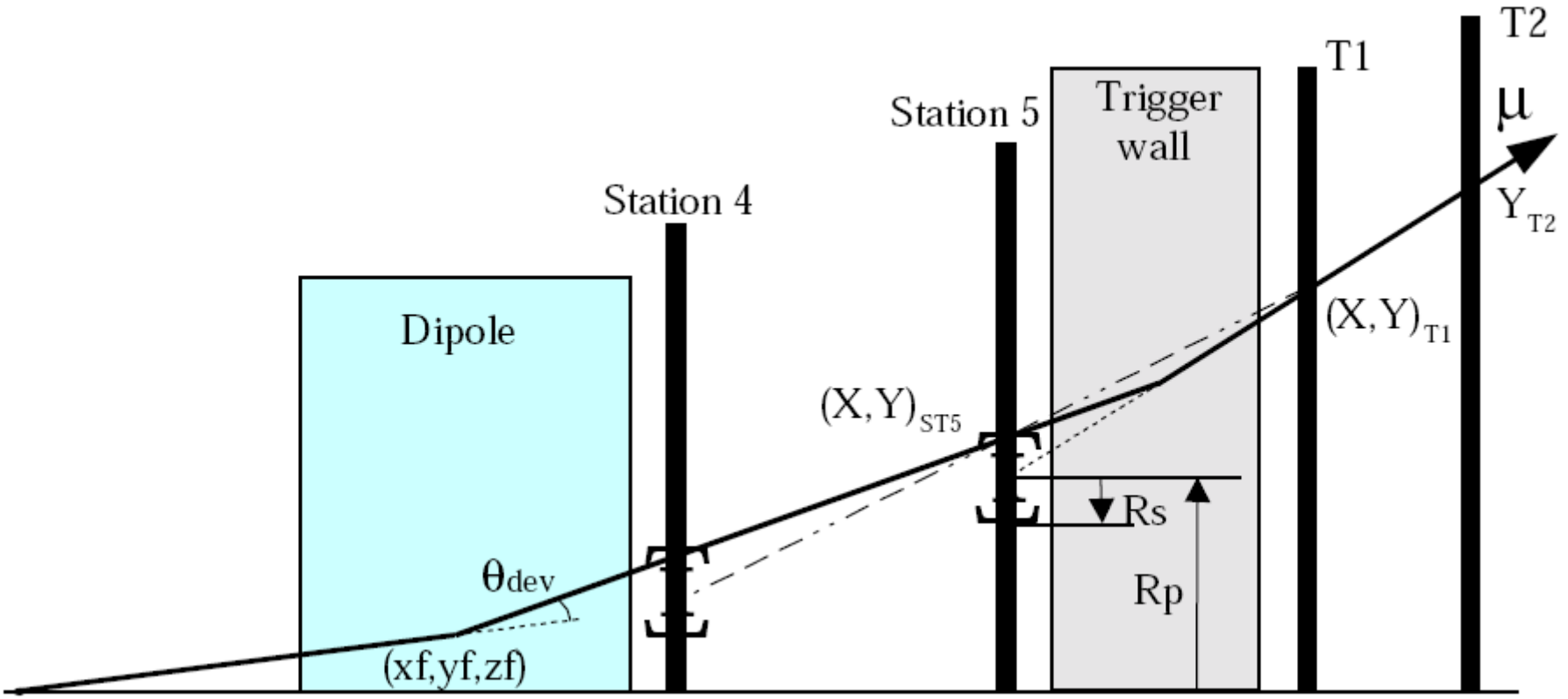
ALICE offline week, CERN 02-06 October, 2006

Inverse HLT algorithm ?

ALICE-INT-2002-04 version 1.0

F. Manso and the Clermont-Fd ALICE group



The Purpose

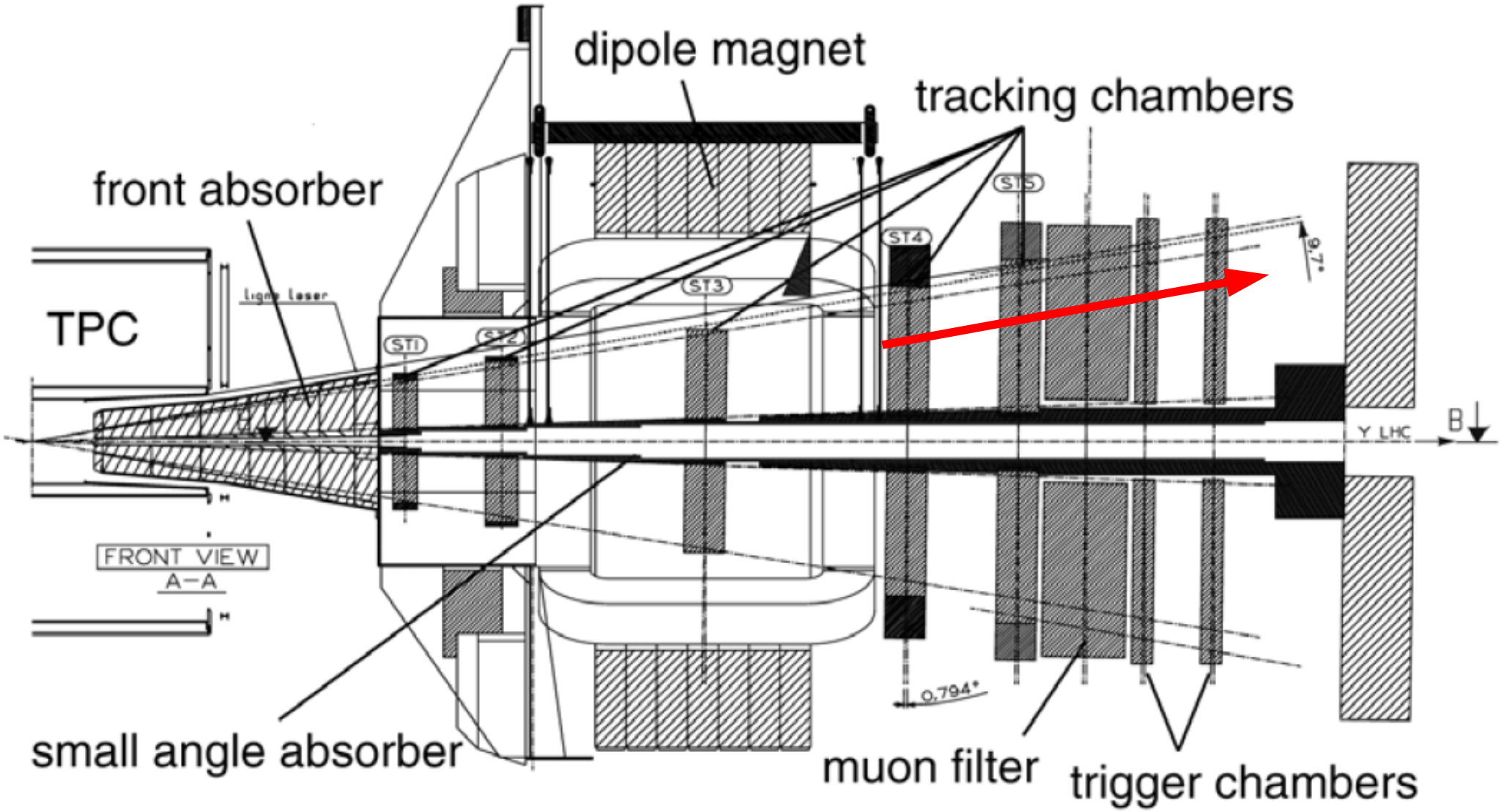
We have MOOD online to check the trigger information:
- uniformity of hit strips (dead channels, etc.)
- re-apply the trigger algorithm (by software) and check the trigger decision

In addition:
- the event reconstruction provides the tracks which are "susceptible" to give a trigger, and we can check if the raw data contains a corresponding trigger information
- furthermore we can check if the trigger information is what expected
- we can do this on a kinematics basis, once we have the reconstructed momentum

The Method

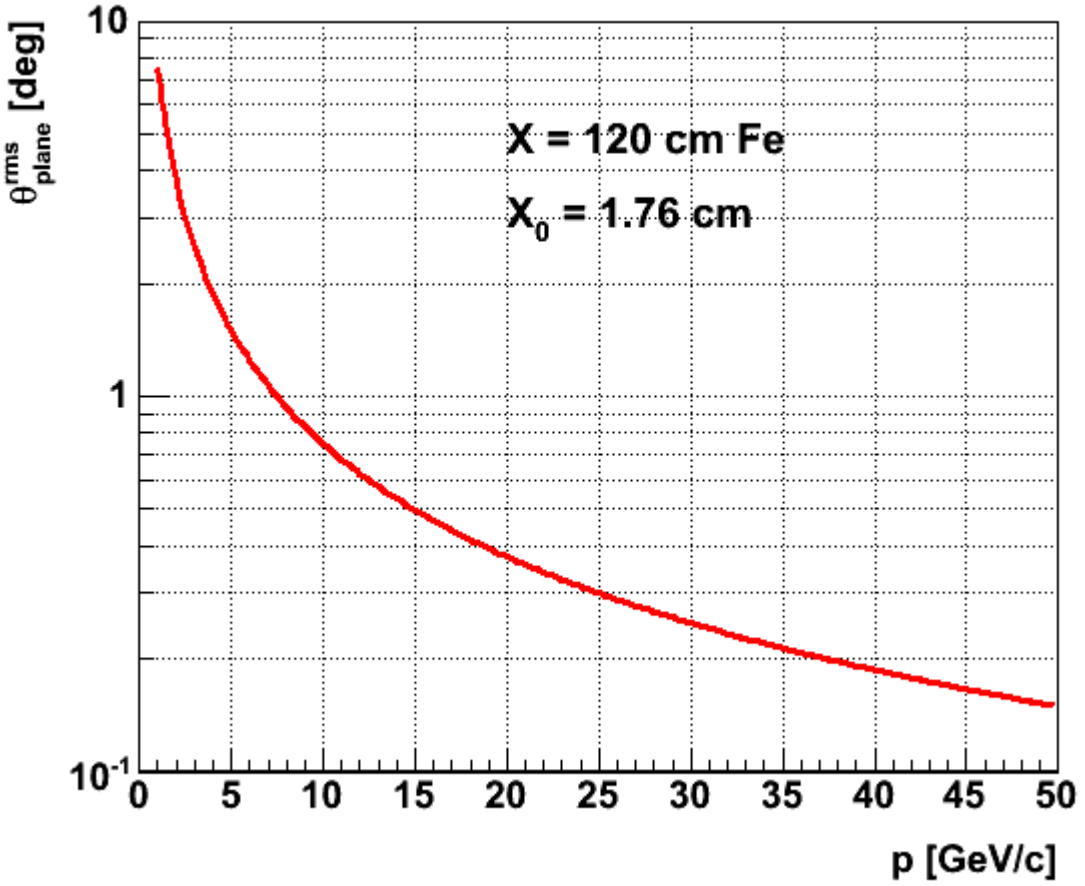
Use the straight part of the tracks in the last 2 tracking stations (4 chambers) and propagate them over the distance to the trigger chambers through the muon filter

The MUON Arm Tracker and Trigger



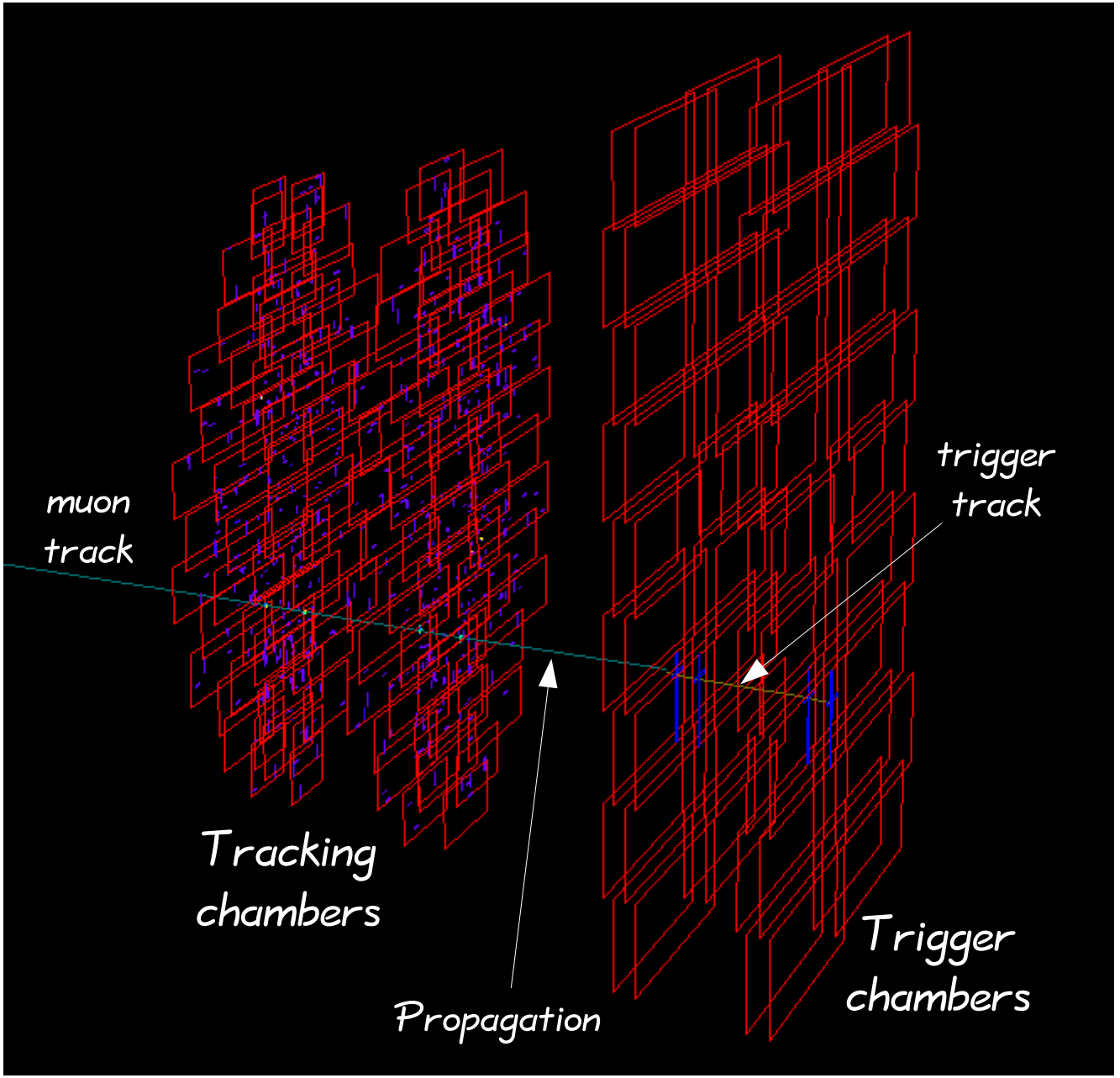
The uncertainty of the method…

The multiple scattering in the iron wall (muon filter) between the tracking chambers and the trigger chambers



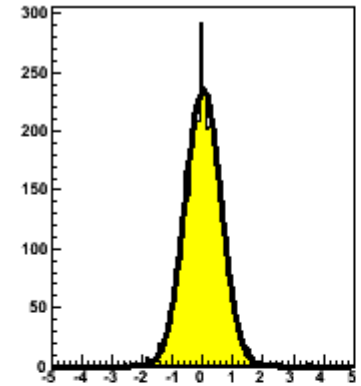
… and what else could have happened to the track in the filter …

Event Display Example with a 20 GeV/c muon

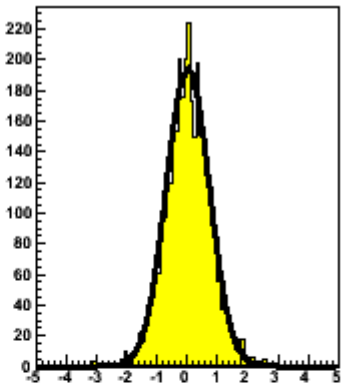


Uncertainty due to multiple scattering

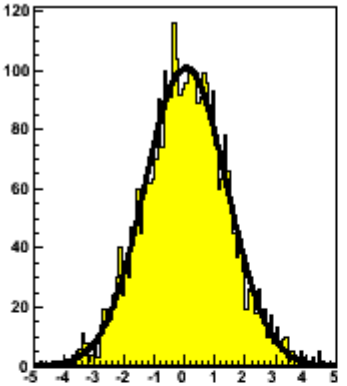
distance from the prolongation impact point to the real MC hit
(20 GeV/c muon)



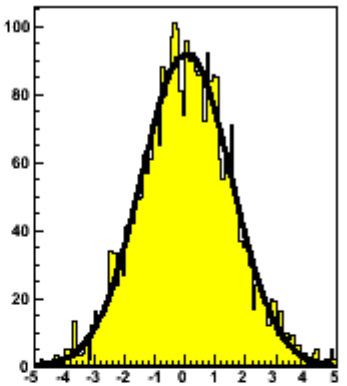
MT11 X_{fit}-X_{hit} σ = 0.58 cm



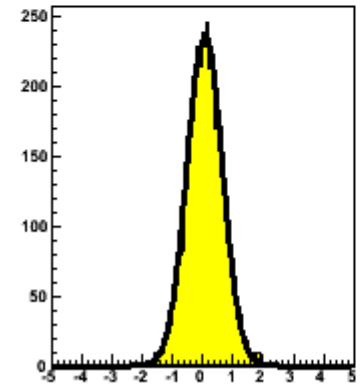
MT12 X_{fit}-X_{hit} σ = 0.70 cm



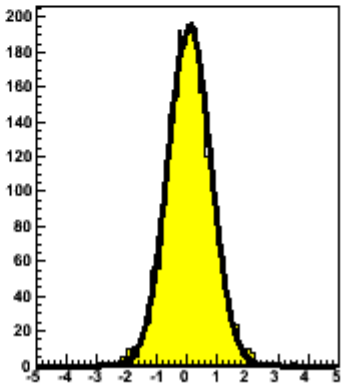
MT21 X_{fit}-X_{hit} σ = 1.34 cm



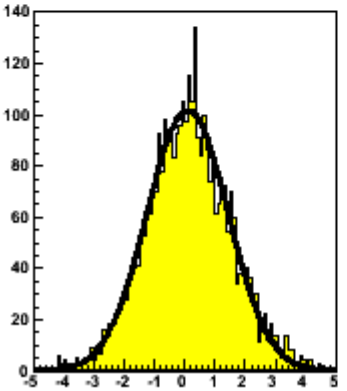
MT22 X_{fit}-X_{hit} σ = 1.48 cm



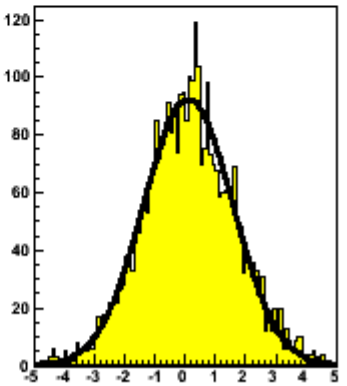
MT11 Y_{fit}-Y_{hit} σ = 0.57 cm



MT12 Y_{fit}-Y_{hit} σ = 0.70 cm



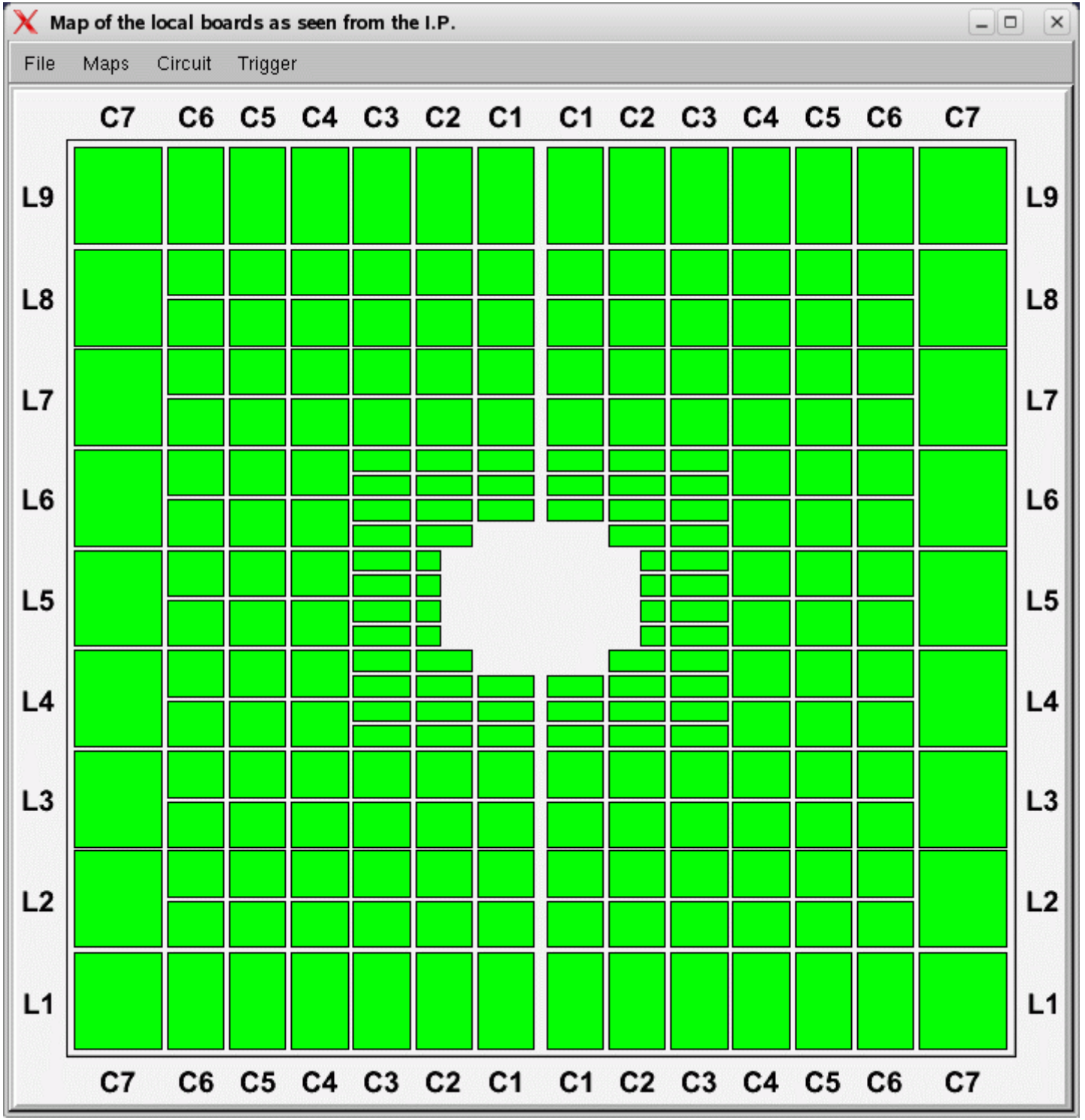
MT21 Y_{fit}-Y_{hit} σ = 1.33 cm

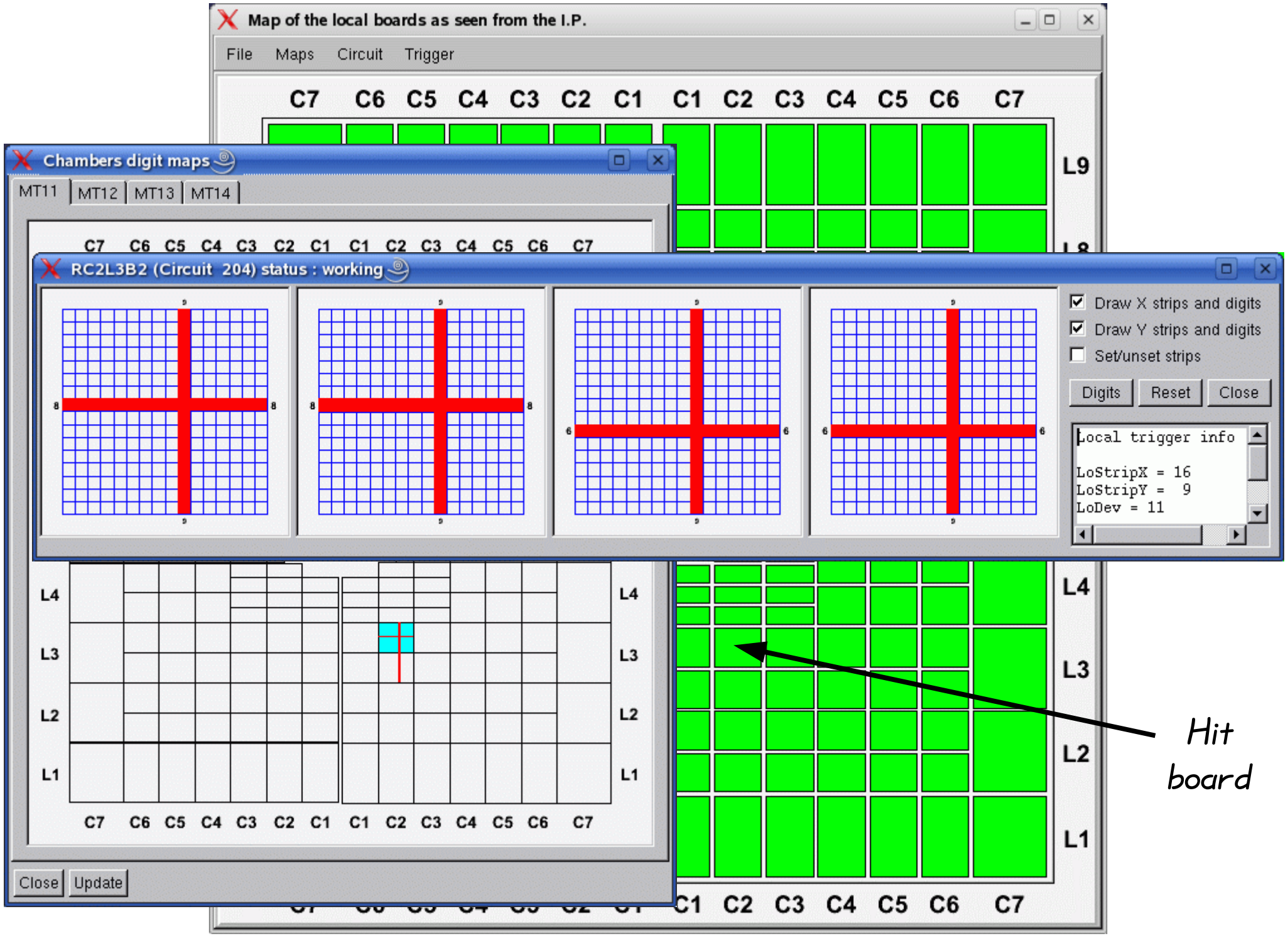


MT22 Y_{fit}-Y_{hit} σ = 1.47 cm

The trigger information in the representation of the offline trigger display and debugging tool:

AliMUONTriggerGUI


Map of the local boards as seen from the I.P.
File
Maps
Circuit
Trigger
C7 C6 C5 C4 C3 C2 C1 C1 C2 C3 C4 C5 C6 C7
L9
L8
L7
L6
L5
L4
L3
L2
L1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Trigger
C7 C6 C5 C4 C3 C2 C1 C1 C2 C3 C4 C5 C6 C7
L9
L4
L3
L2
L1
Chambers digit maps
MT11
MT12
MT13
MT14
RC2L3B2 (Circuit 204) status : working
Draw X strips and digits
Draw Y strips and digits
Set/unset strips
Digits
Reset
Close
Local trigger info
LoStripX = 16
LoStripY = 9
LoDev = 11
Close
Update
Hit board

First results

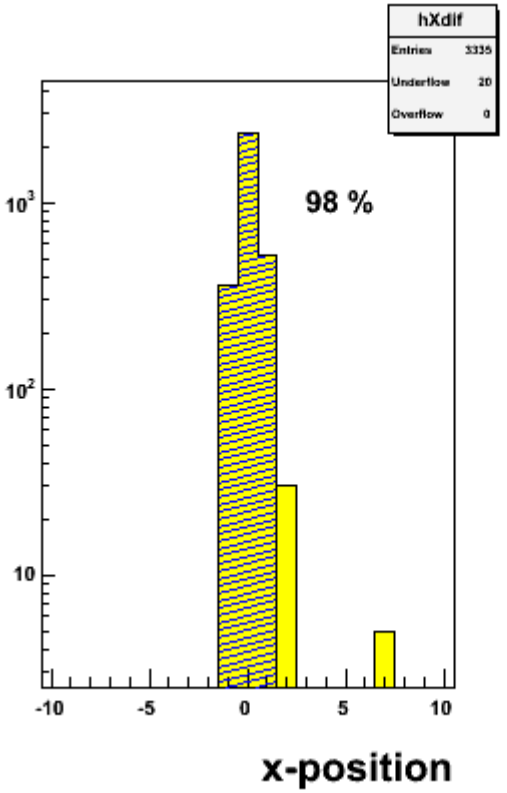
Single 20 GeV/c muon per event, 5000 events

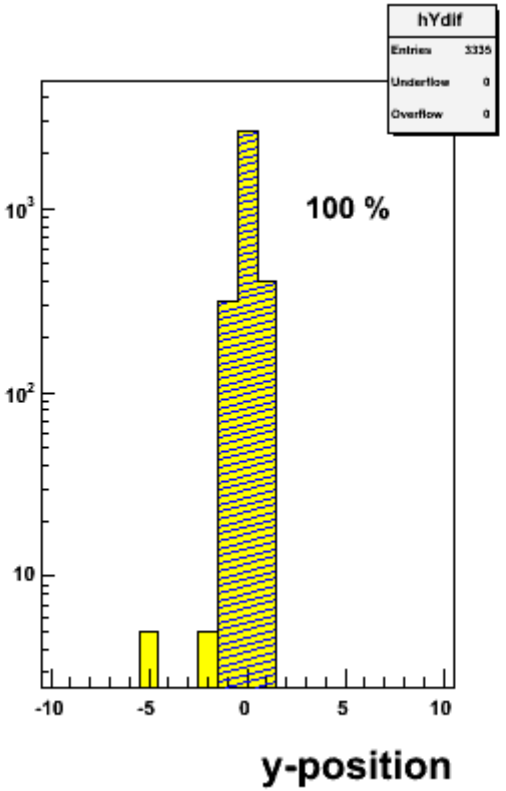
Condition: track with points in all 4 chambers of the last two tracking stations

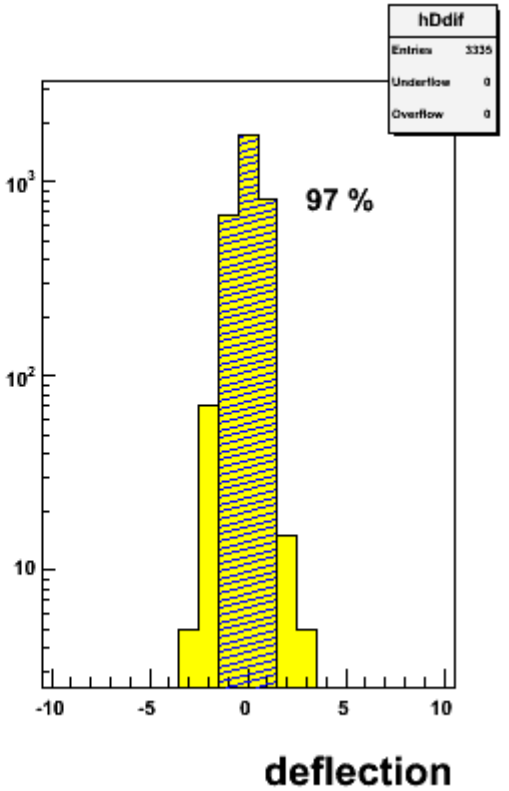
Differences between the "fast" and "slow" trigger responses

fast - reconstructed track prolongation to the trigger chambers

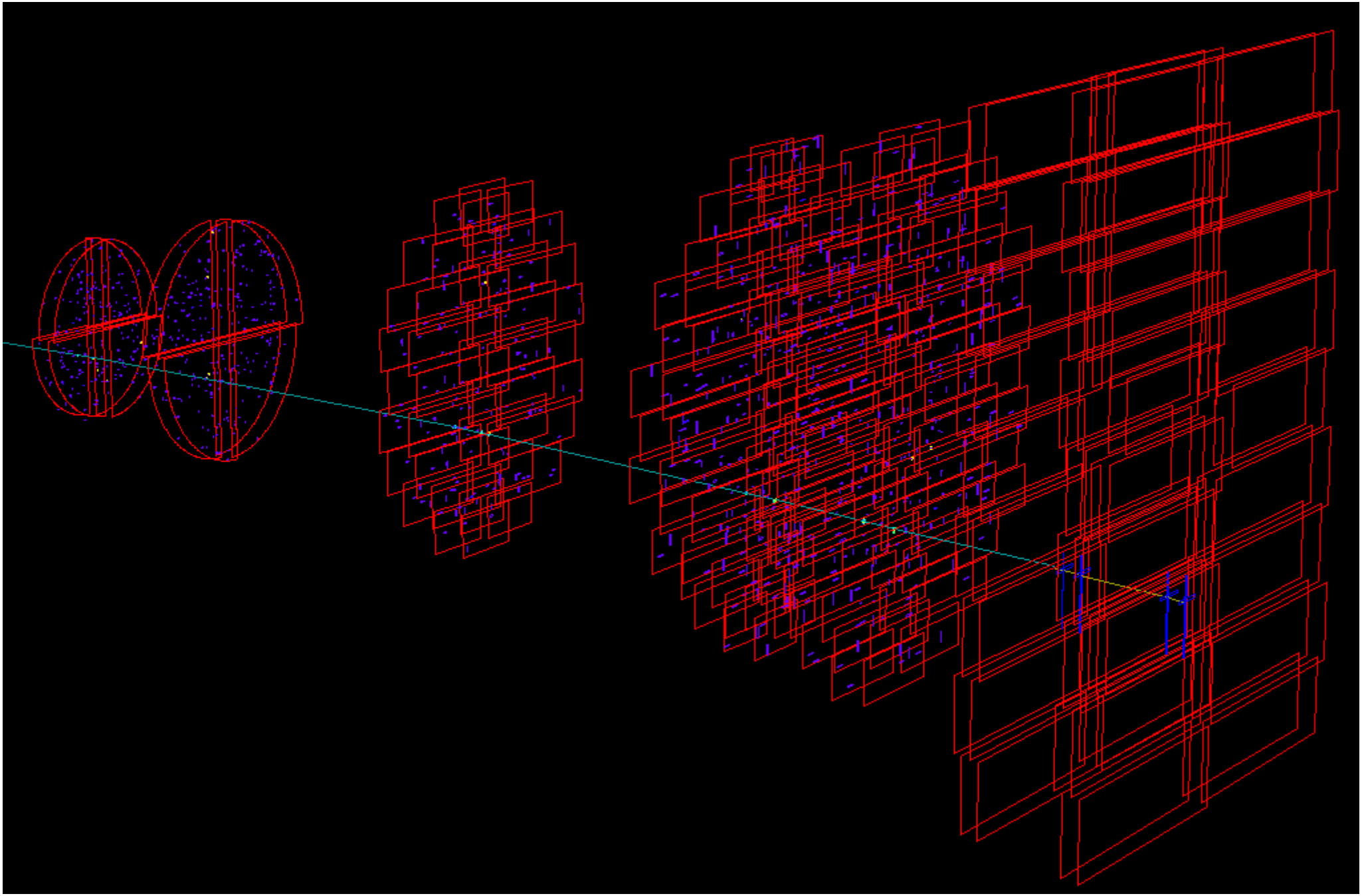
slow - trigger information stored in the raw data



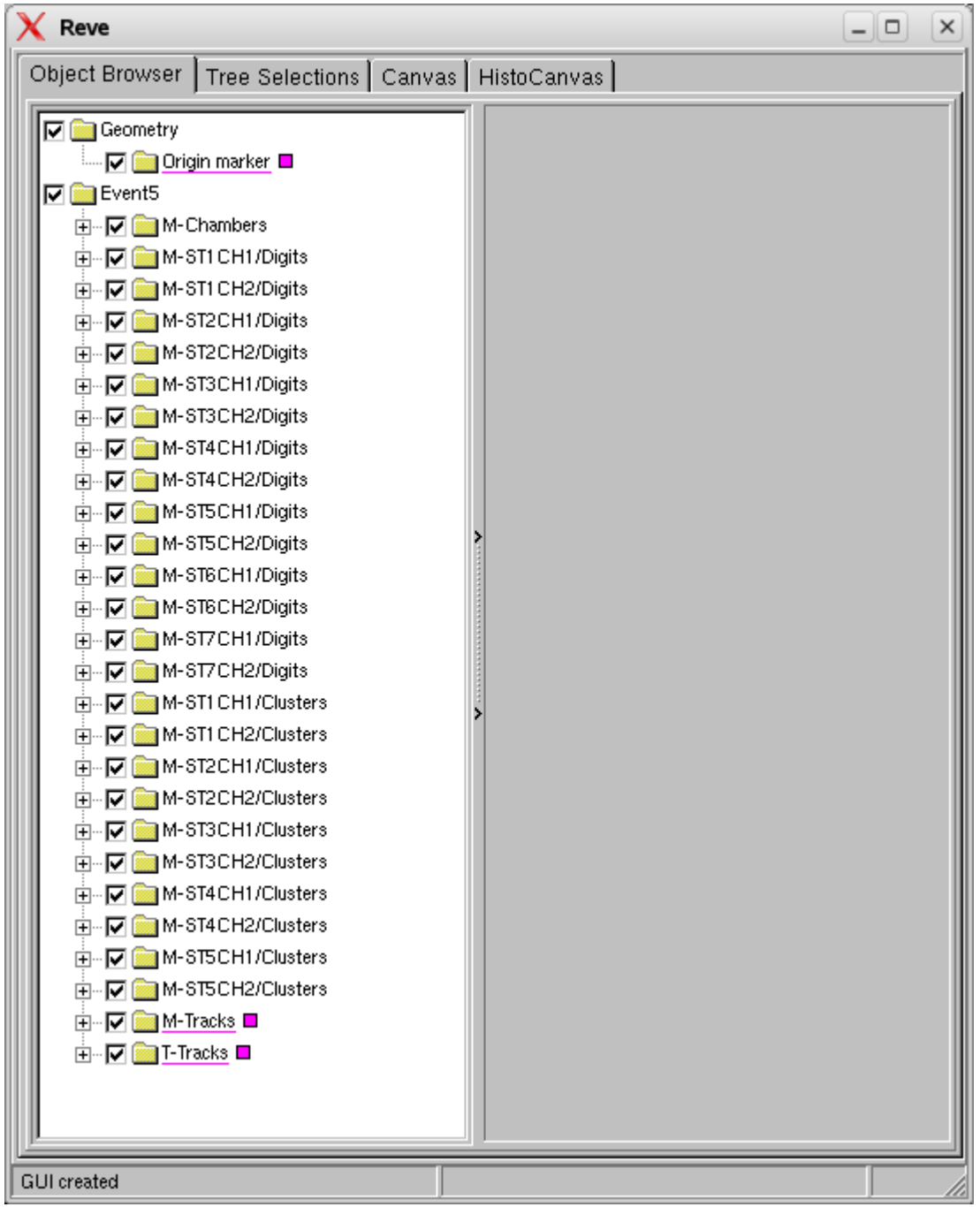




Simulation-data visualisation within the AliRoot event display EVE



Simulation objects in the event display



AliRoot HEAD 25 Sep 2006

.raw raw-data

- clusters
- tracks

.root raw-data

- space problems at creation of raw-data:

  /tmp/mdc1
  /tmp/mdc2

ToDo

Tests with high momentum single muon OK !

PDC06 muon results:

- track selection
- momentum dependence
- higher track multiplicity

Event display:

- first tests with AliRoot objects converted from the raw-data (under investigation)
- direct access to the raw-data