# Low pt muon identification

pp→J/ψ(μ(6)μ(3)) was simulated with initial layout atlsim700.01

bb→ μ(6)X background dataset

## Release 7.0.1

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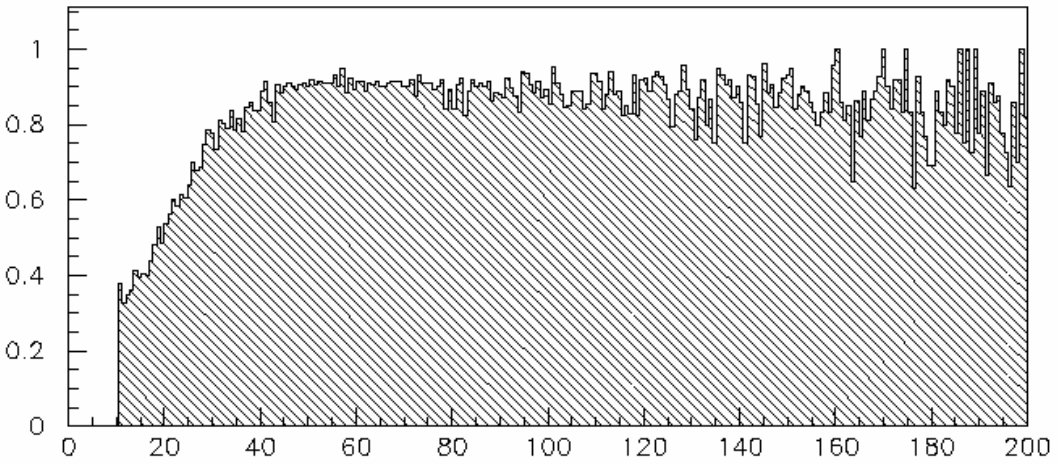
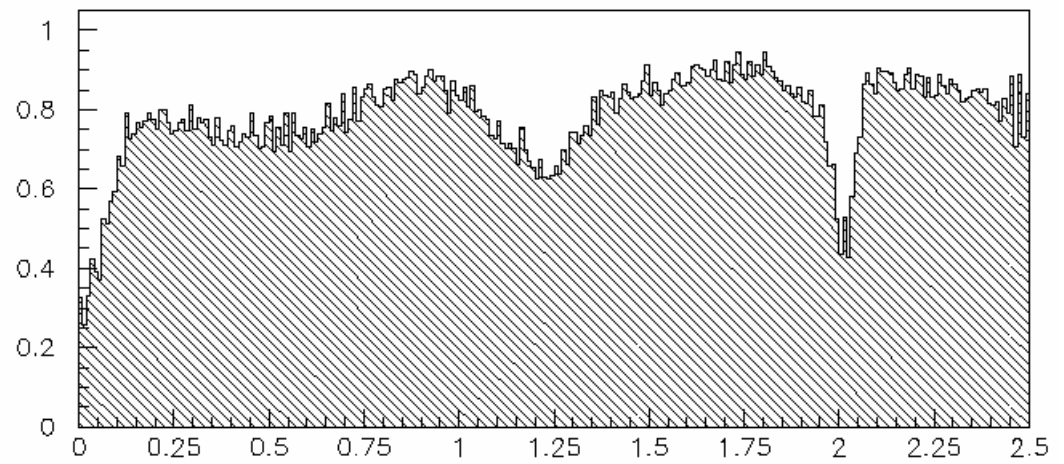
# Moore reconstruction

The efficiency of tracks reconstruction in the Muon System vs. $\mathbf{p_t}$ and $\eta$



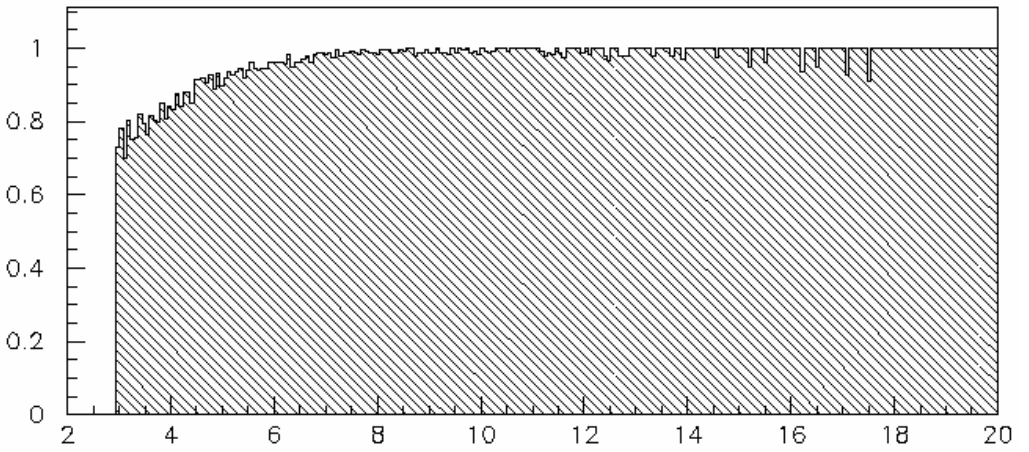

$\mathbf{p_t}$



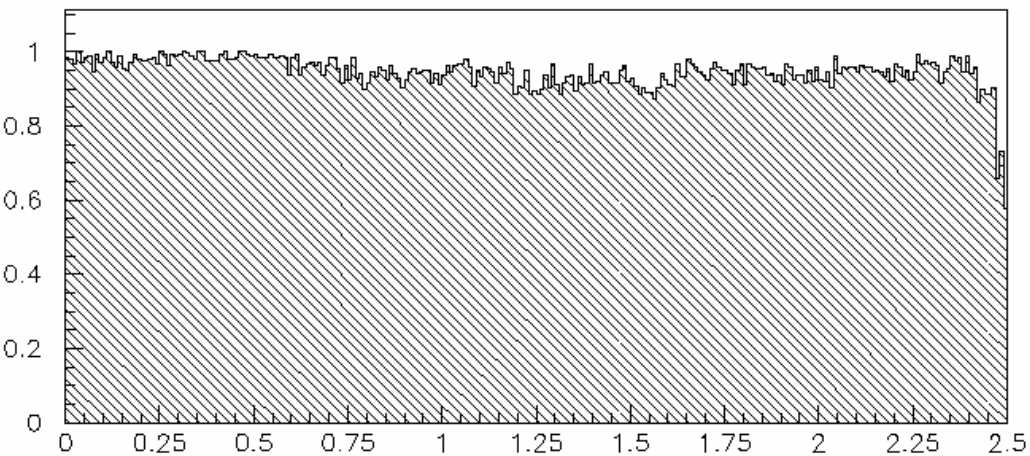

$\eta$

# MUID stand alone

The efficiency of the Muid Stand Alone efficiency vs. $p_t$ and $\eta$



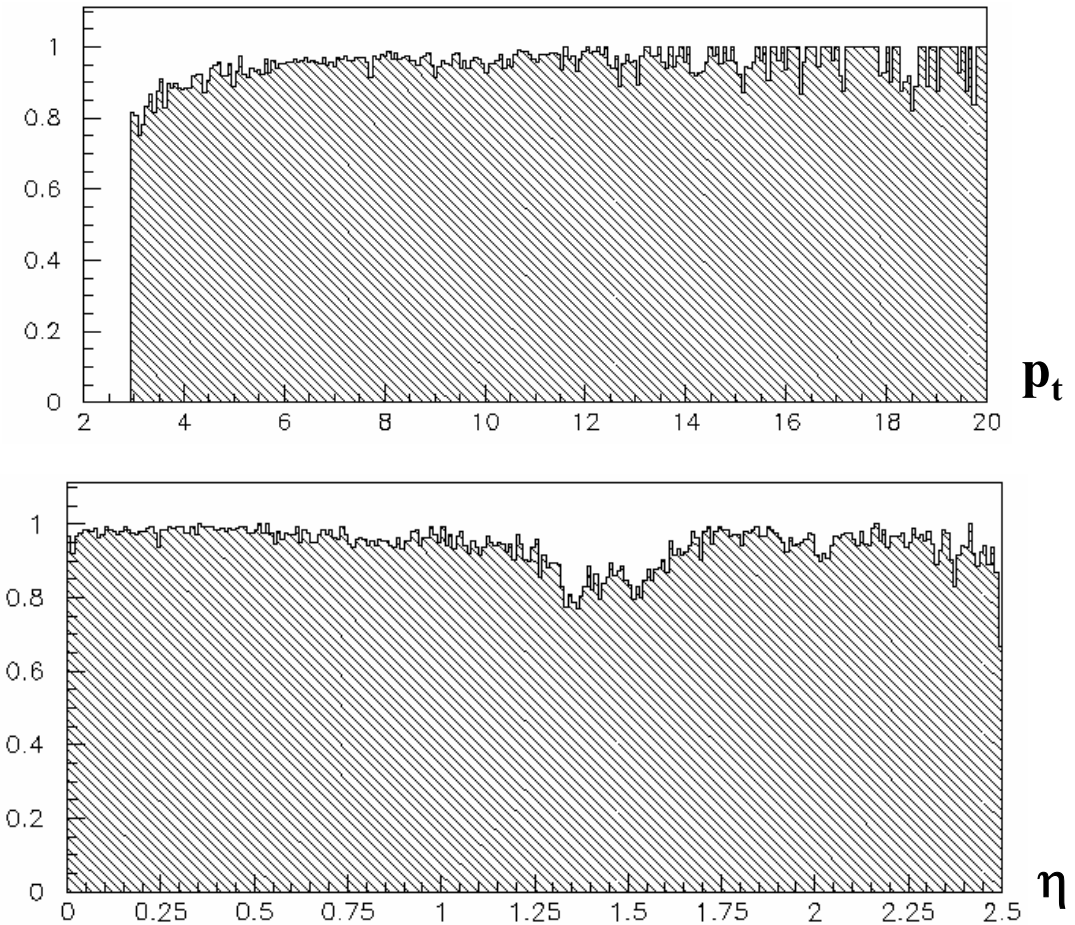

$p_t$




$\eta$

# MUID MuidComb

The efficiency of the MuidComb efficiency vs. $p_t$ and $\eta$



# Dimuon ($J/\psi \rightarrow \mu(3)\mu(6)$)reconstruction efficiency

| *Generated tracks* | *ID tracks* | *MOORE tracks* | *MUID tracks* |
|---|---|---|---|
| 20000 | 98% | 57% | 50% |

In 44% of the events only one muon is reconstructed by MUID!!!

My purpose is to find the second muon by using the association between ID tracks and Moore digits

Muid

1st μ

2nd μ missing

Muid – ID track association

Inner detector (ID)

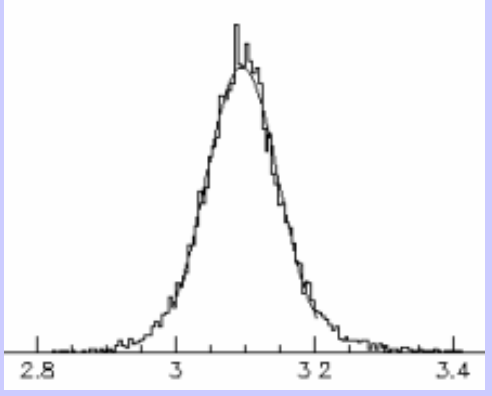
1st track

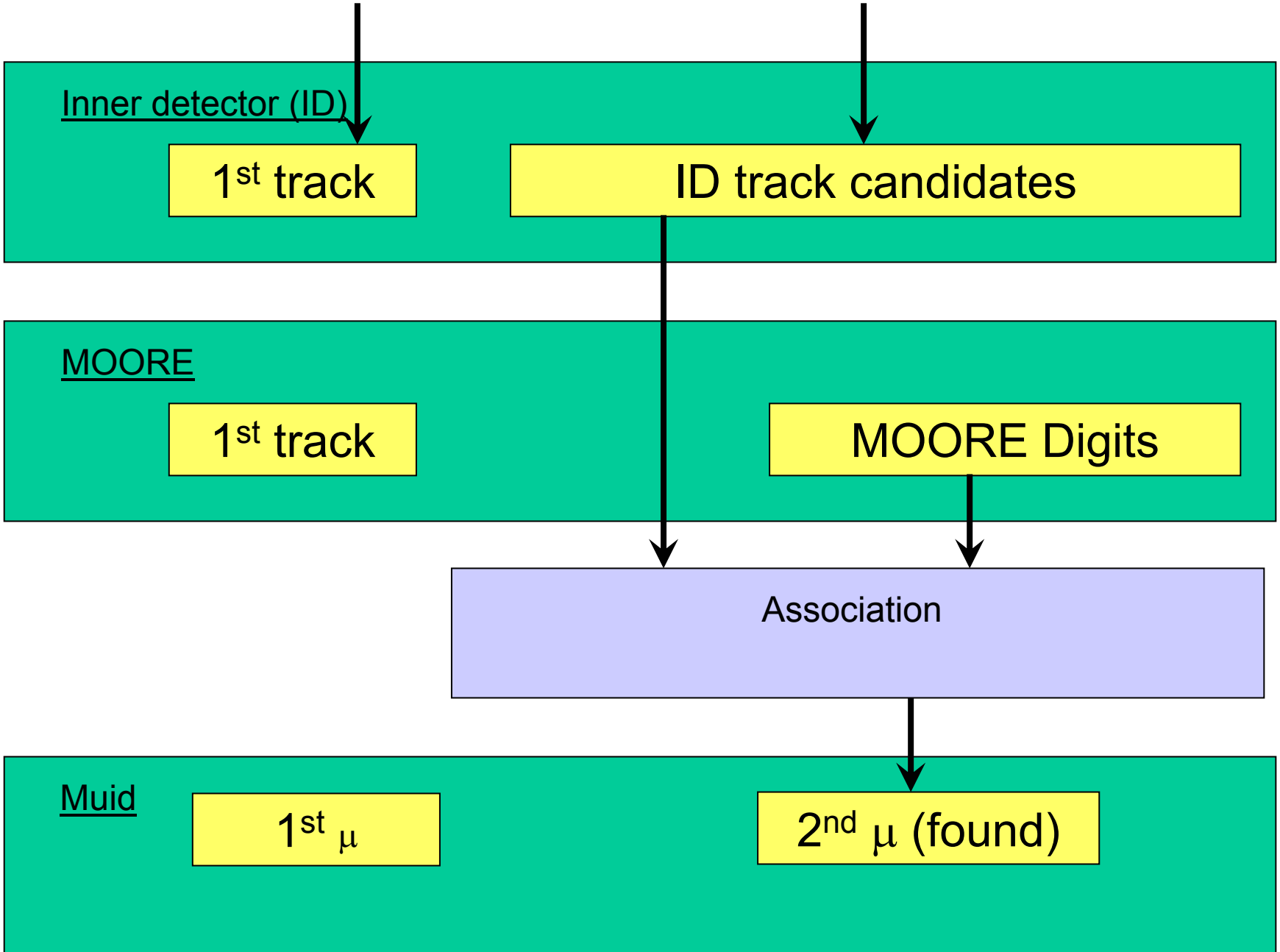
Collection of non-associated ID tracks

Invariant mass filtering

$M_{J/\psi}=3.096\,GeV$

Invariant mass window : 2 – 4 GeV




Inner detector (ID)
1st track
ID track candidates
MOORE
1st track
MOORE Digits
Association
Muid
1st μ
2nd μ (found)

*20000 events pp→J/ψ(mu(6) mu(3))*

***Cut_1*** ***Invariant mass window 2-4GeV***

***Cut_2*** ***3GeV<pt (ID candidates)<10Ge***

*89% ID_tracks (ID_candidates) after CUT_1 and CUT_2*

***Cut_3*** ***ID candidate-MDT digits***

*(inner station)* ***association*** *or* ***ID candidate-CSC digits association***

*ID candidates that were associated with MDT digits or CSC digits* → ***ID candidates - RPC/TGC digits***

# *Pp→J/ψ(μ(6)μ(3)) dataset* ***σ=5nb***

*(44% events have only one muon reconstructed by MUID)*

| | Number of "pseudo - muons" | Number of re-reconstructed MUONS PURITY |
|---|---|---|
| MDT+CSC | 6255(71.5%) - 100% | 6218 – 99.4% |
| MDT+CSC+PHI | 5760(66%) - 100% | 5726 – 99.3% |

# *bb→μ(6)X background dataset* ***σ=3600nb***

*(80% events have one muon ...)*

| | Number of "pseudo-muons" | Number of re-reconstructed MUONS PURITY |
|---|---|---|
| MDT+CSC | 203(0.85%)-100% - 98654 | 56 - 27.5% - 27130 |
| MDT+CSC+PHI | 139(0.58%)-100% - 67317 | 52 - 37.4% - 25176 |

# *Conclusions*

- ***71.5 % of muons were re-reconstructed (by using only MDT and CSC digits information) with purity 31.7%***
- ***66 % of muons were re-reconstructed (by using MDT, CSC, TGC, RPC digits information) with purity 42.2%***

# *Muon week plan:*

- *Details of ID- MOORE digits association*
- *Invariant mass distribution of signal +background*