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pp exclusive events at $T=29$ GeV

What we can do with CBM ?

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pp→Jpsi (l+l-) pp

Details :

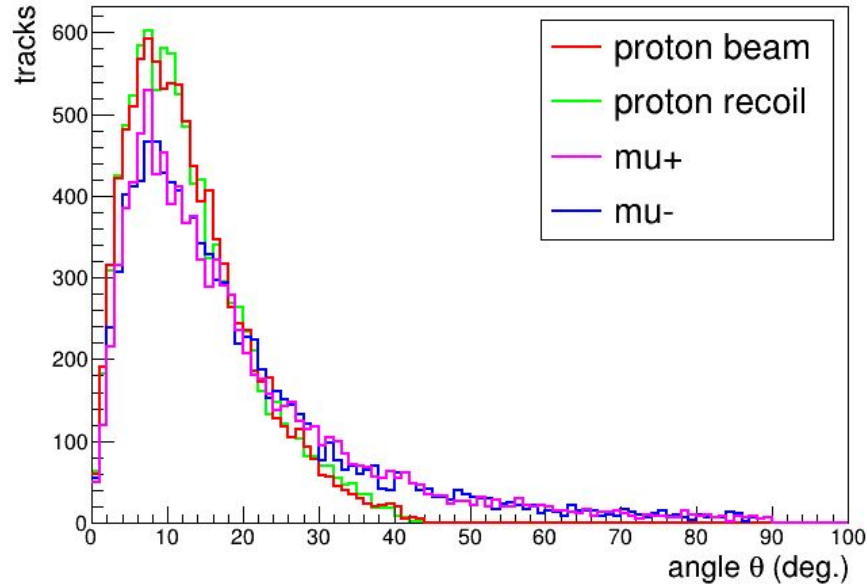
- Event Generator : Pluto
- T (lab) = 29 GeV proton beam
- No target in CBM transport

→ Monte Carlo hits and tracks analysis to get an idea of CBM acceptance

Angular acceptance (from MCTracks)

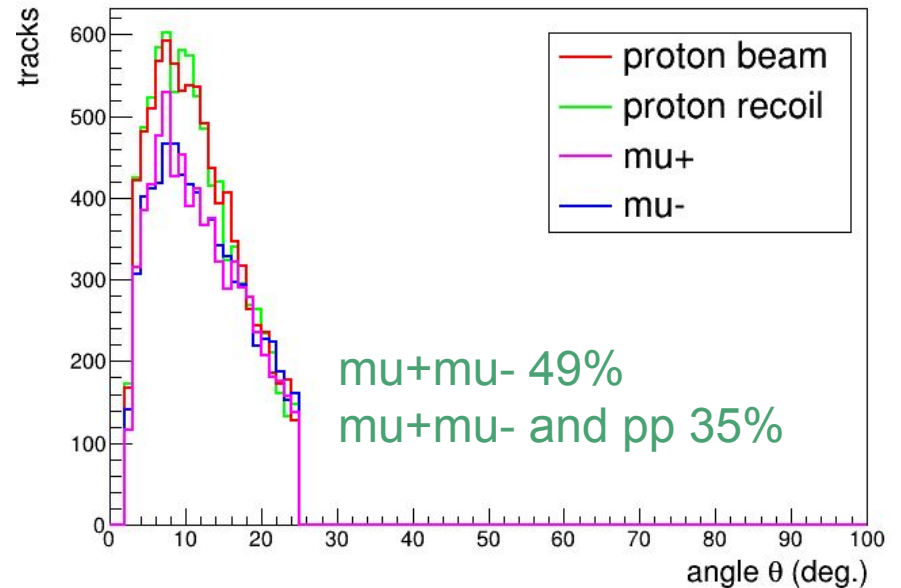
Pluto

angle θ

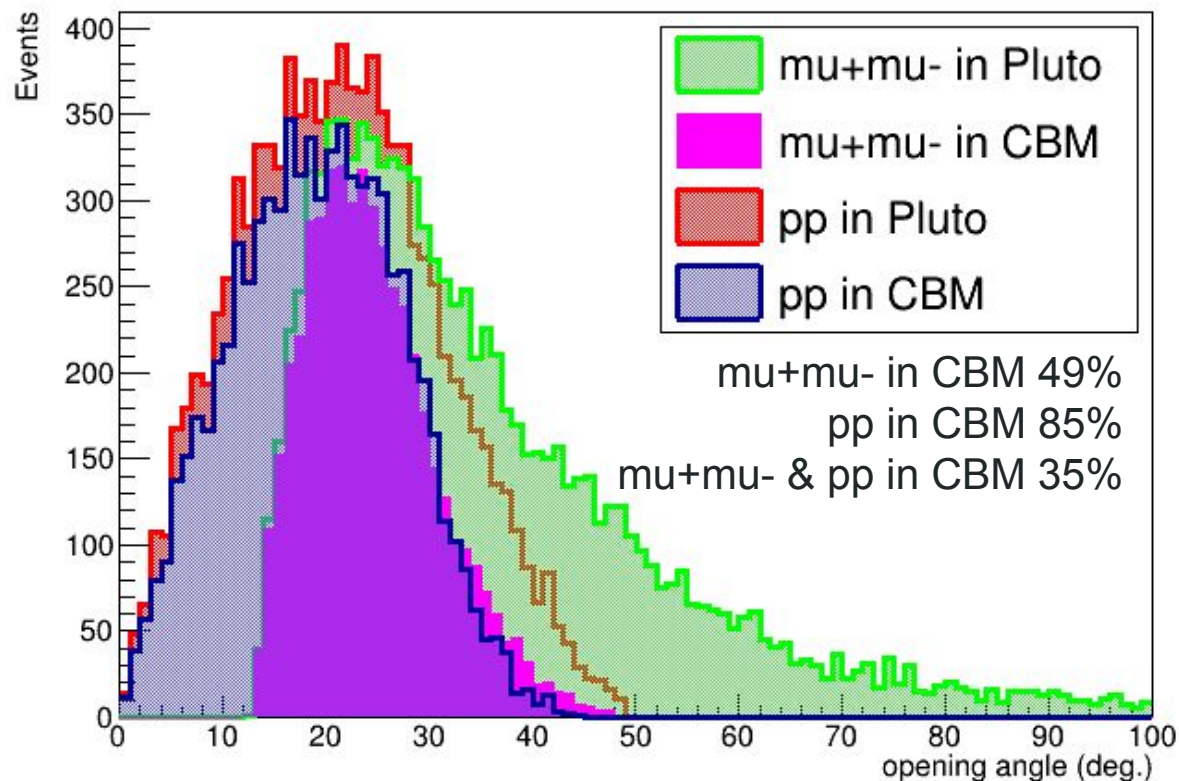


Within CBM acceptance

angle θ



Opening angle of outgoing particles

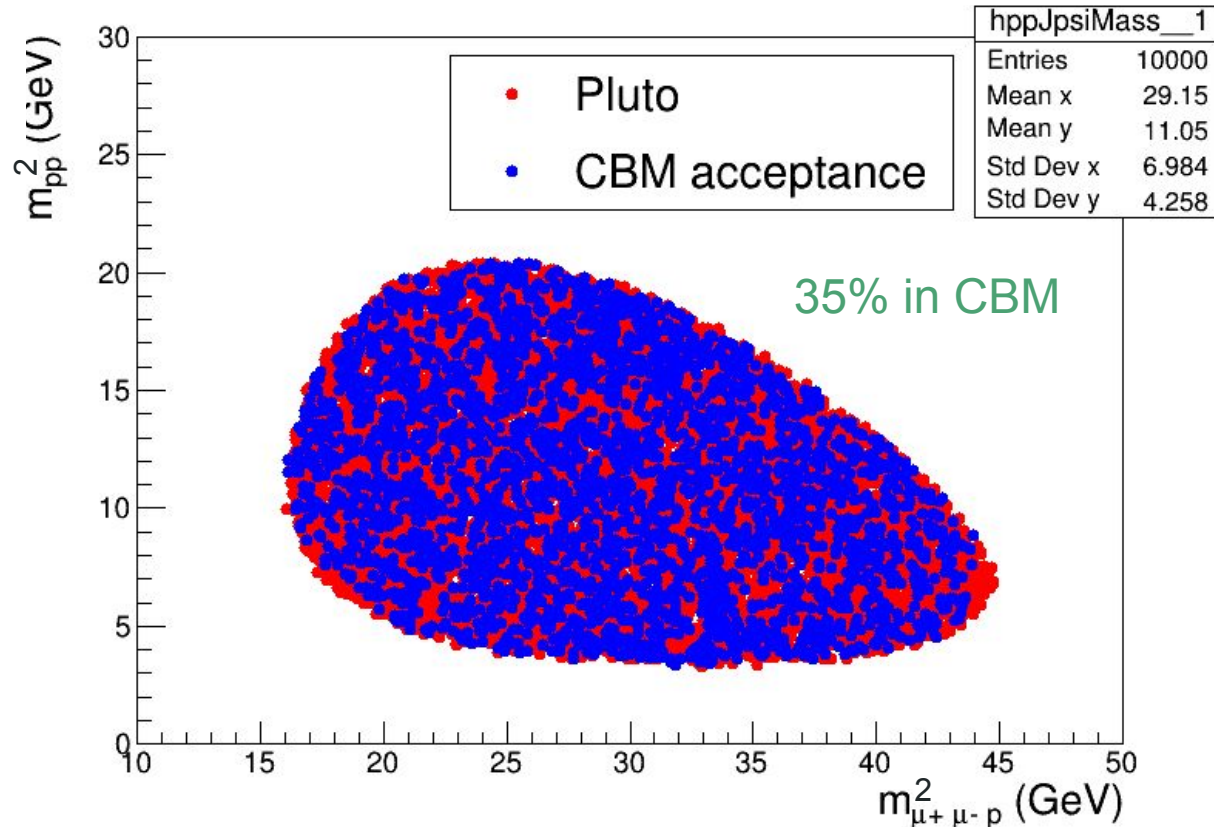


Numbers match with
fast simulation

Link to slides :

<https://hyperons-at-hades.slack.com/files/U041J67SUQ7/F07R2P5LSMP/2023-03-02-redpandaretreat-02.pdf>

Inv Mass² Phase space



What can be reconstructed?

MUCH LMVM configuration

Particles (in addition to mu+ mu-)	STS 7th station hit (% of events)	STS 7th station hit +TRD hit (% of events)	STS 7th station hit +TOF hit (% of events)
No proton	49.3	46.3	48.0
1 proton	47.5	0.95	1.96
2 protons	34.5	0.0	0.0

22% secondaries tracks/event

17% charged secondaries tracks/event

What can be reconstructed?

Electron configuration

Particles (in addition to e+ e-)	STS 7th station hit (% of events)	STS 7th station hit +TRD hit (% of events)	STS 7th station hit +TOF hit (% of events)
No proton	50.7	47.2	48.5
1 proton	49.0	45.0	46.0
2 protons	36.0	28.0	25.0

Summary

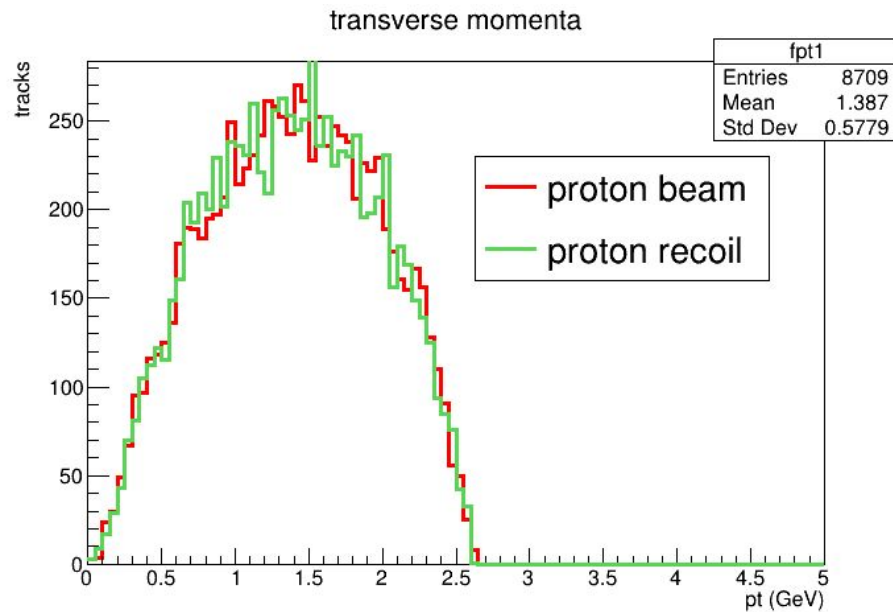
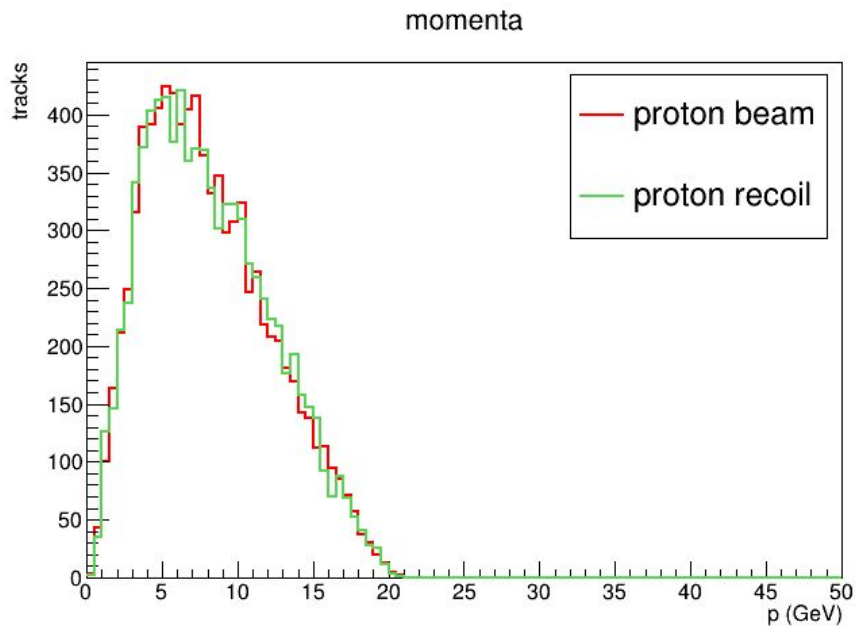
- $pp \rightarrow J/\psi(\mu^+\mu^-)$ pp possible with the CBM detector setup : muon_1mvm
- 35% events are reconstructable (only STS tracks) without proton PID
- $pp \rightarrow J/\psi(e^+e^-)$ pp possible with the CBM detector setup : electron
- 28% events are reconstructable (STS+TRD) with PID of all final state particles

Next tasks

- pp \rightarrow J/psi pp reconstruction within CBMROOT
- Other exclusive channels...
- What else?

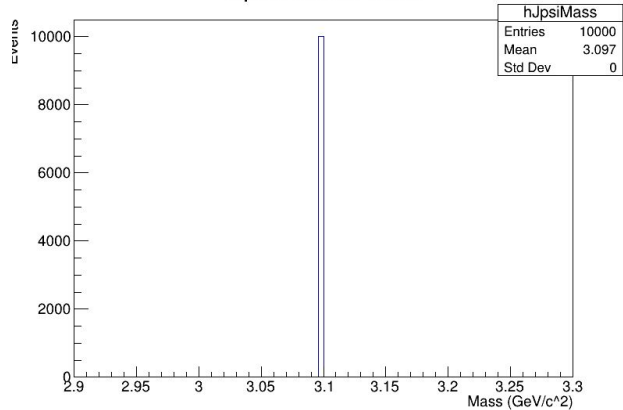
Back ups

Momenta in CBM angular acceptance

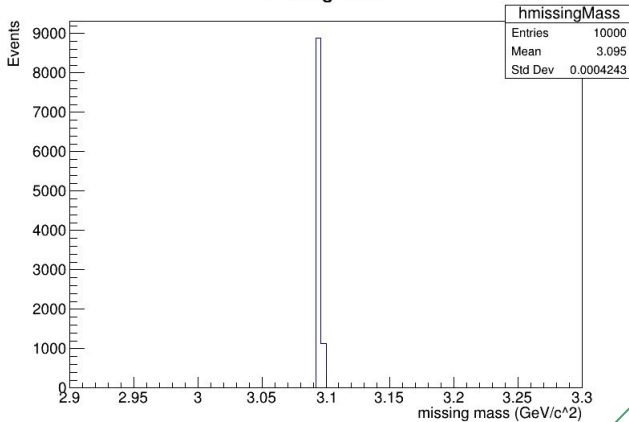


Pluto generator

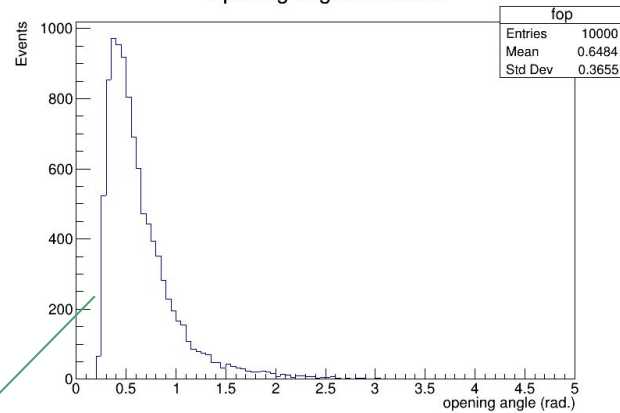
J/psi Invariant Mass



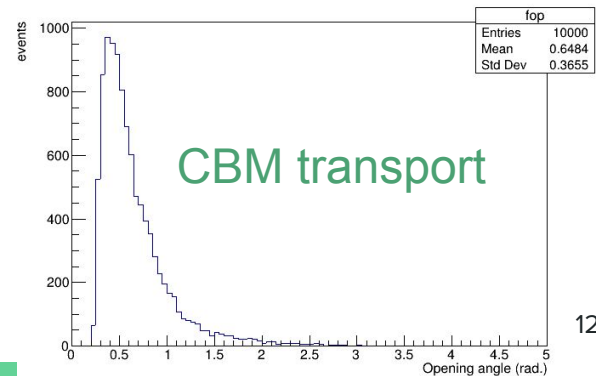
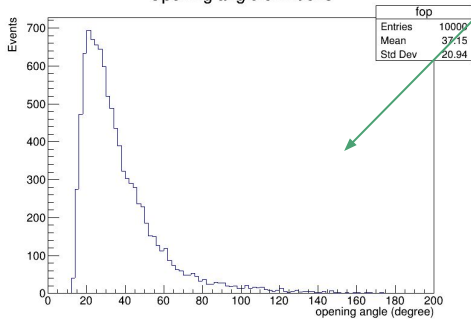
missing Mass



Opening angle of muons

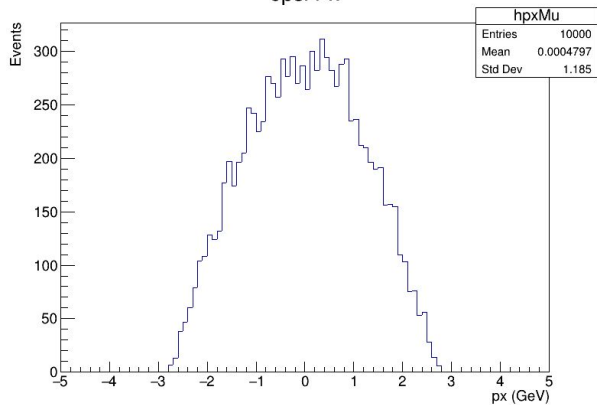


Opening angle of muons

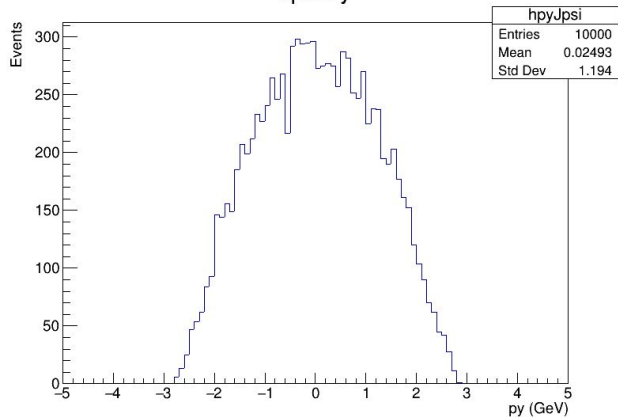


Momentum distributions (Pluto generator)

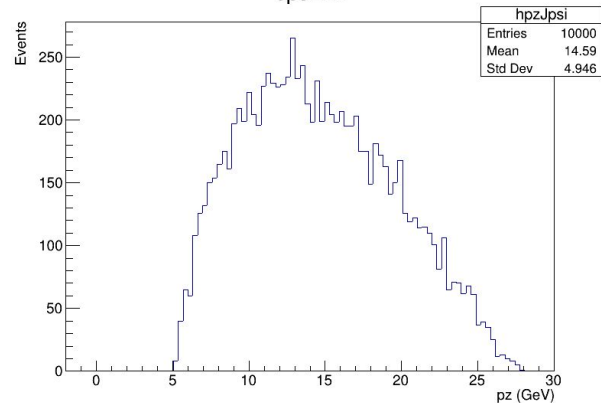
Jpsi Px



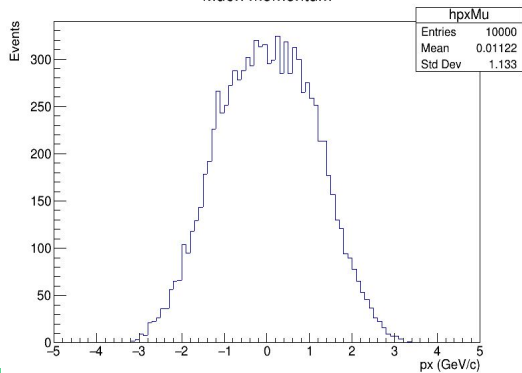
Jpsi Py



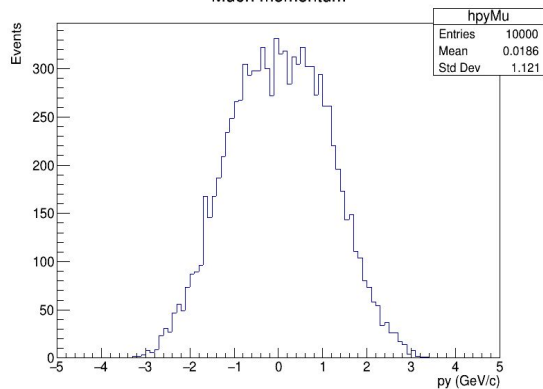
Jpsi Pz



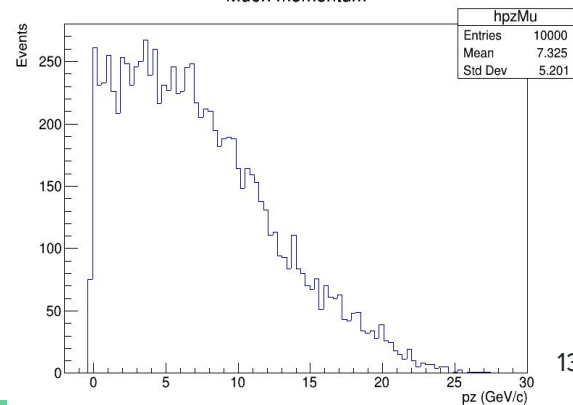
Muon momentum



Muon momentum



Muon momentum



Proton momentum

