

γ/π^0 Isolation Studies

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PWG-GA General Meeting
dedicated to γ/π^0 -hadron correlations

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Aim

- Study the isolation dependence on the type of information {charged, neutral, both} used in the cone
- for γ , π^0 and decays
- vs. p_T (η : ϕ)

Isolated fraction = isolated particle / all

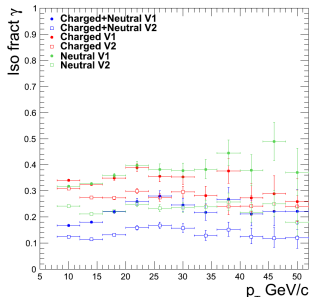
- The lower the fraction is, the purer the sample was (less contamination)
- Efficiency should be checked on MC

Setup

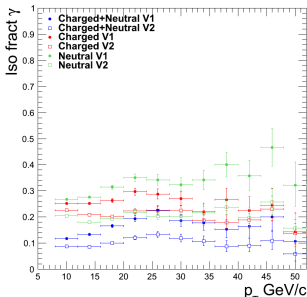
- LHC11d_pp7_pass1 without bad TPC runs ~ 1065000 events (35 runs)
- Isolation cuts :
 - cone size = 0.4,0.3
 - threshold type = $PtThresh < 0.5$ GeV, $SumPtFrac < 10\%$
- Clusterizers : V1 or V2

Isolated γ / all vs. p_T

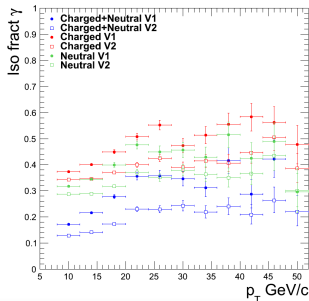
PtThres < 0.5
cone size = 0.3



PtThres < 0.5
cone size = 0.4



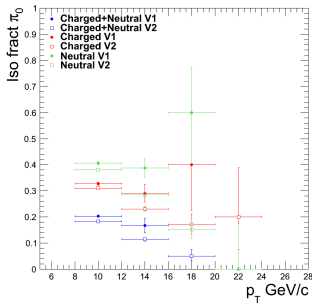
SumPtFrac < 10%
cone size = 0.4



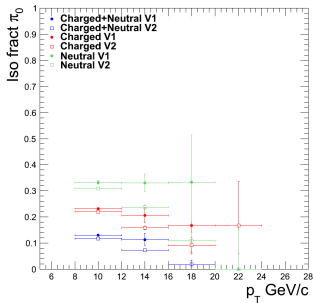
- Using neutral and charged information in the isolation cone helps removing contamination
- Opening the cone reduces slightly the contamination
⇒ check saturation effect above 0.4
- Increase above 10 GeV/c probably due to better removal of π^0
⇒ check MC

Isolated π^0 / all vs. p_T

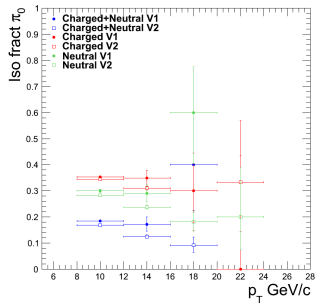
PtThres < 0.5
cone size = 0.3



PtThres < 0.5
cone size = 0.4



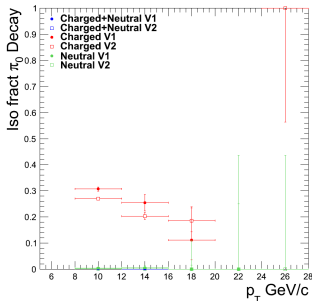
SumPtFrac < 10%
cone size = 0.4



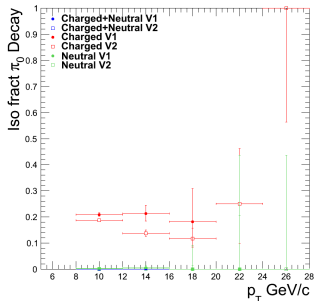
- γ from π^0 are removed : biasing slightly results when they are in the cone
- ⇒ Check MC or embedding of MC in pp real events

Isolated decays / all vs. p_T

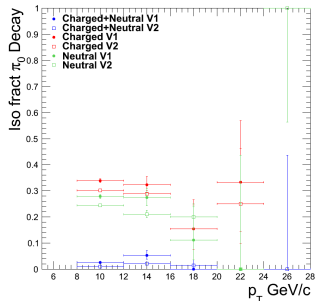
PtThres < 0.5
cone size = 0.3



PtThres < 0.5
cone size = 0.4



SumPtFrac < 10%
cone size = 0.4



- Isolation fraction using **charged information** close between π^0 and decays
- Decays are better identified when adding neutral information.

Summary

Conclusion

- Using charged **and** neutral information in the isolation cone gives a purer sample
- ⇒ Need MC to validate this

Todo

- Vary systematically
 - Isolation methods (*try also SumPtThresIC*)
 - Thresholds
 - Cone sizes
 - Clusterizers
- Compute efficiencies for the same parameters once MC is available or using γ embedded in pp real events
- Look at PbPb once background subtraction is implemented