

First test on $B^0 \rightarrow K^{*0} \mu \mu$ using 2024 data

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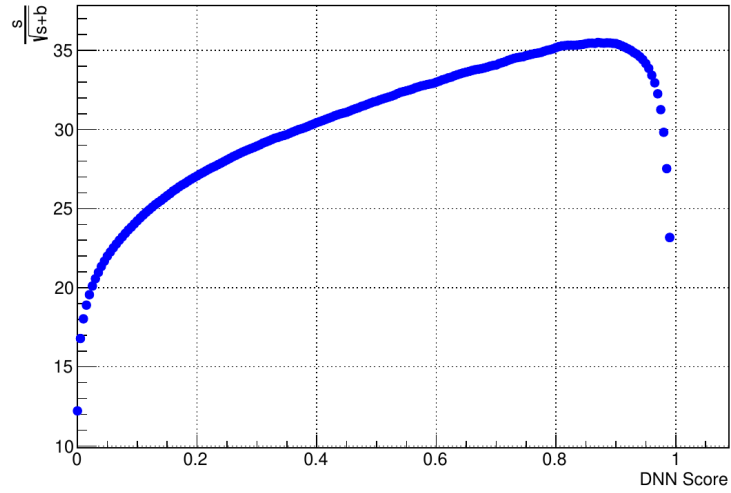
First test on 2024 data

Preliminary test done for a three-years graduate student thesis

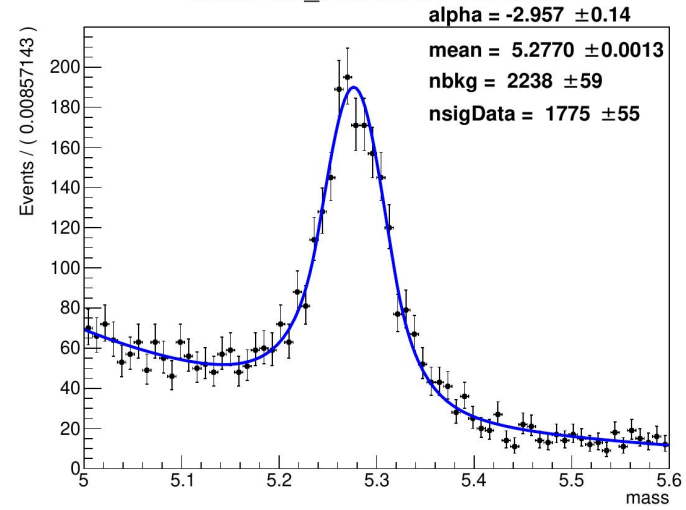
- Ntuple's skim using the code developed for Run2, updated for Run 3 (<https://github.com/CMSKStarMuMu/miniB0KstarMuMu/tree/run3-test>)
- Trigger and preselection :
 - HLT_DoubleMu4_3_LowMass
 - Data: /ParkingDoubleMuonLowMass*/Run2024*-PromptReco-v*/MINIAOD
 - MC : /BdtoKstar2Mu-KstartoKPi_TuneCP5_13p6TeV_pythia8-evtgen/RunIII2024Summer24MiniAOD-140X_mcRun3_2024_realistic_v26-v2/MINIAODSIM
 - MC(FilMu):/BdtoKstar2Mu-KstartoKPi_Fil-Mu_TuneCP5_13p6TeV_pythia8-evtgen/RunIII2024Summer24MiniAOD-140X_mcRun3_2024_realistic_v26-v3/MINIAODSIM
 - MC (J/psi)
/BdToJpsiKstar_Par-SoftQCDnonD_TuneCP5_13p6TeV_pythia8-evtgen/RunIII2024Summer24MiniAOD-140X_mcRun3_2024_realistic_v26-v2/MINIAODSIM
 - MC (J/psi FilMuPt2):
/BdToJpsiKstar-JpsiToMuMu_Fil-MuPt2_Par-SoftQCDnonD_TuneCP5_13p6TeV_pythia8-evtgen/RunIII2024Summer24MiniAOD-140X_mcRun3_2024_realistic_v26-v2/MINIAODSIM
 - mu-mu Vtx CL [0.005] => was [0.1] in Run2
 - mu-mu L/sigma w/respect to BS [2] => was [3] in Run2
 - mu-mu DCA w/respect to each other [0.5 cm]
 - mu DCA w/respect to BS [2.0 cm]
 - mu-mu cos(alpha) w/respect to BS [0.9]
 - mu min pT [3.0] => was [4.0] in Run2
 - mu max eta [2.4]
 - mu-mu min pT [4.9 GeV/c] => was [6.9] in Run 2
 - mu-mu min inv. Mass [1.1 GeV/c²]
 - mu-mu max inv. Mass [4.8 GeV/c²]
 - B0 mass lower limit [4.5 GeV/c²]
 - B0 mass upper limit [6.5 GeV/c²]
 - B0 Vtx CL [0.01]
 - K*0 (OR K*0bar) mass window sigma [3.0]
 - hadron DCA/sigma w/respect to BS [0.5] => was [0.8] in Run2
 - hadron min pT [0.5 GeV/c] => was [0.8] in Run2
 - B0 mass upper limit before performing the fit [20.]
- Quite a number of crab jobs failed, (memory/walltime/stage out)
 - It might be due to the looser preselections wrt Run2
 - Automatic splitting option in crab produce too many jobs (limit in crab is set 10⁴)
- A solution could be to limit the mass windows for B0 candidates to [4.9,5.9]
- So far, only 2024C [0-3] [5-6] and 2024Ev2 [0-3] are completed and used in this first test and are @T3_IT_MIB

WP DNN studies

Figure of merit DNN



MassData_ScoreDNN>0.870000



Check using only Data

Figure of merit DNN

