JpsiEtap fit model

July 10th 2019, Annecy/Edinburgh meeting, M. Chefdeville

Intro

- Previous fit: first attempt to include physics backgrounds
 - JpsiPiPi with fixed yields + JpsiK* included
- New fit
 - Include signal with random photon
 - Processed JpsiPhi (Run II MC available from Sevda)
 - Include JpsiKpipi (Run I MC)
- Our MC requests: all PPG OK but still hanging.





Signal pdf(s)

• Signal MC-truth cut = mycut = myjpsi & mypions & mygamma

TCut **myjpsi** = "mu_plus_MC_MOTHER_KEY==mu_minus_MC_MOTHER_KEY && abs(mu_plus_MC_MOTHER_ID)==443 && abs(mu_plus_MC_GD_MOTHER_ID)==531 && abs(mu_plus_TRUEID)==13 && abs(mu_minus_TRUEID)==13"

TCut **mypions** = "abs(pi_plus_TRUEID)==211 && abs(pi_minus_TRUEID)==211 && pi_plus_MC_MOTHER_KEY==pi_minus_MC_MOTHER_KEY && abs(pi_plus_MC_MOTHER_ID)==113 && abs(pi_plus_MC_GD_MOTHER_ID)==331 && abs(pi_plus_MC_GD_GD_MOTHER_ID)==531"

TCut **mygamma** = "gamma_TRUEID==22 && abs(gamma_MC_MOTHER_ID)==331 && abs(gamma_MC_GD_MOTHER_ID) =531"

• !mycut: unexpected peaking structure



Signal pdf (!mycut)

- Splitting !mycut into !mypions and !mygamma: peaking structure in 2 cases
- Photons matched to following "decays":
 - $\gamma \rightarrow \gamma \rightarrow \eta \rightarrow B$
 - $\gamma \rightarrow e \rightarrow \gamma \rightarrow \eta \rightarrow B$
- Pions matched to following cases:
 - TRUEID=13 (pion decay)
 - TRUEID=0 (?)



Signal pdf(s)

- These peaks are at the percent level comp. to the fully truth-matched decay
- Exclude them for now to build the lineshape of $J/\psi\eta[\rho\overline{\gamma}]$
- Between m(B)=[5,6] GeV/c², J/ $\psi\eta[\rho\gamma]$ & J/ $\psi\eta[\rho\overline{\gamma}]$ have comparable efficiency
 - Fix the ratio when building the signal pdf



JpsiPhi[PiPiPi0]

• Evt type 13244410 (decfile), 2M 2016

Beam6500GeV-2016-MagUp-Nu1.6-25ns-Pythia8/ Sim09d/Trig0x6139160F/Reco16/Turbo03/Stripping28r1NoPrescalingFlagged

- Cocktail of direct & resonant decays: rhopi (55%), rho0pi0 (28%), pipipi0 (16%)
 - Different efficiencies as one cuts on m(pipi)
 - But same m(B) shape \rightarrow merge all events
- Fit separately samples with photons from pi0(phi) and from rest of the event



Current fit

- Signal pdf composed of Bs[J/ $\psi\eta[\rho\gamma]$], B0[J/ $\psi\eta[\rho\gamma]$] and Bs[J/ $\psi\eta[\rho\overline{\gamma}]$]
- Physics bkg are JpsiPiPi, JpsiK*, JpsiPhi and JpsiK1
- Yields are all floating for now
 - Need new signal MC and Run II JpsiKpipi MC to assess relative efficiencies



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Outlook

- Send a recall about the MC requests
- Work on JpsiPiPi fit to include same contributions as in JpsiEtap