Work status

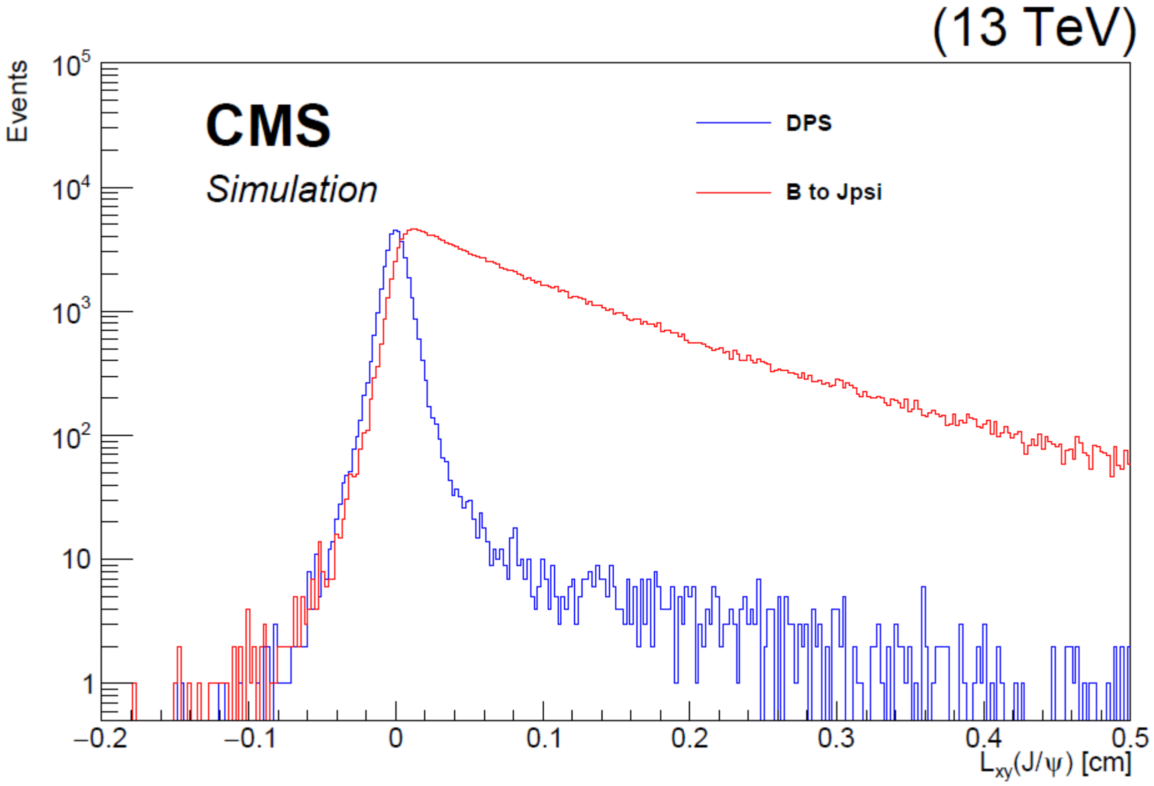
2022.9.1

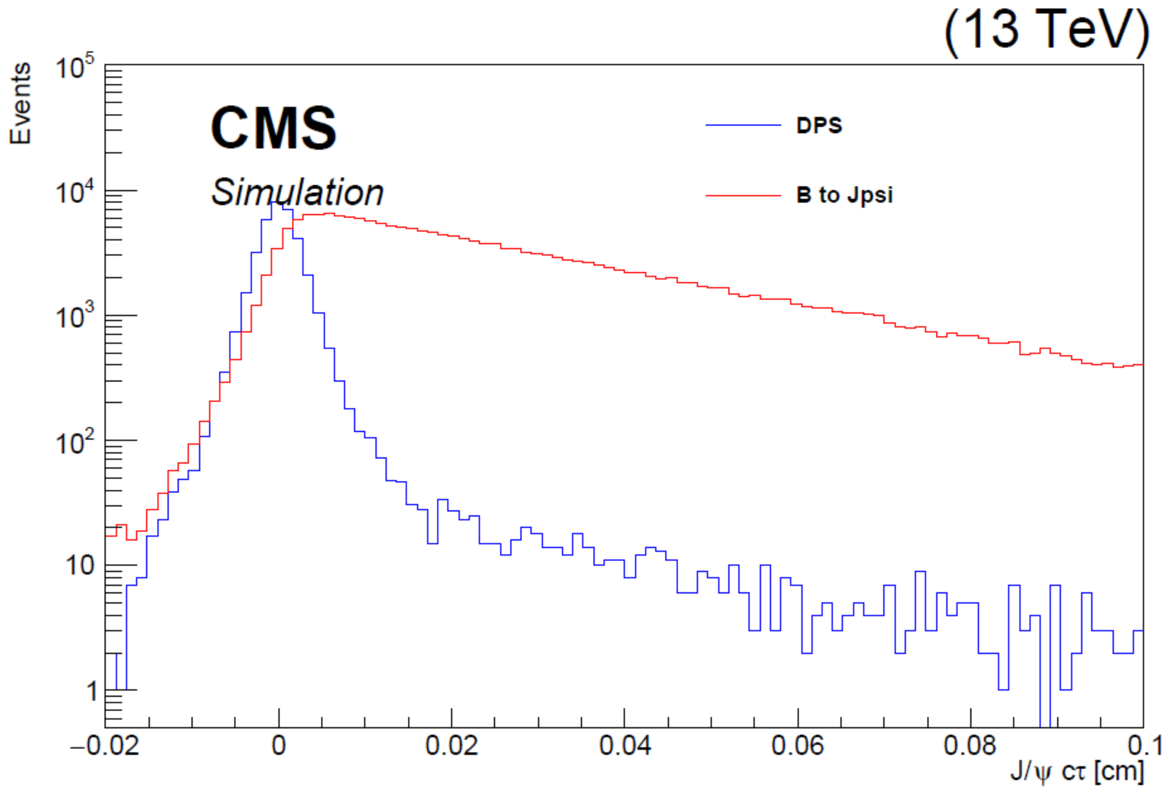
TaozheYU

Compare Prompt and Non-prompt

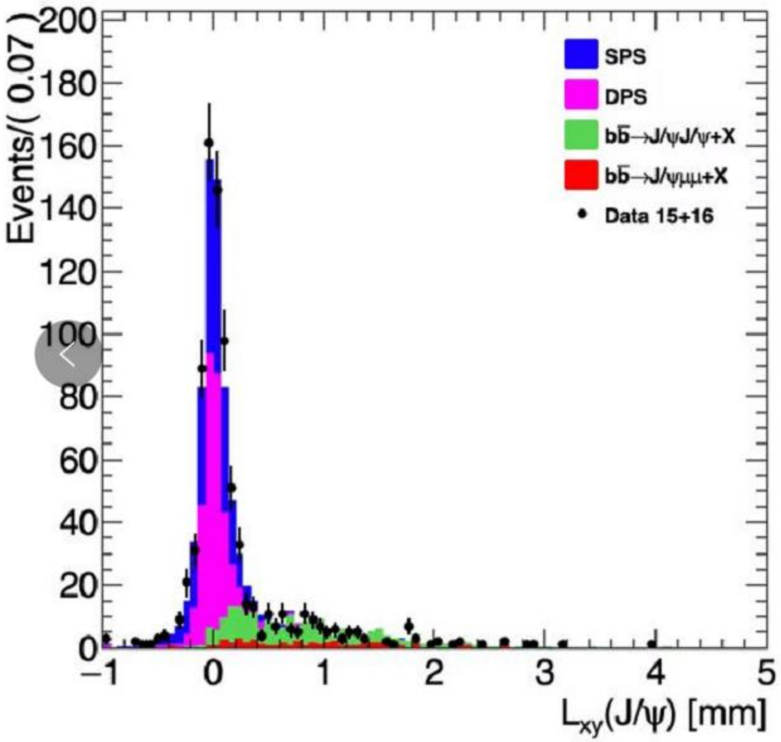
- I add the the Jpsi(two muon vertex) lxy and ctau calculation in the code
- I use the official sample B->Jpsi to get Jpsi lxy and ctau distribution:

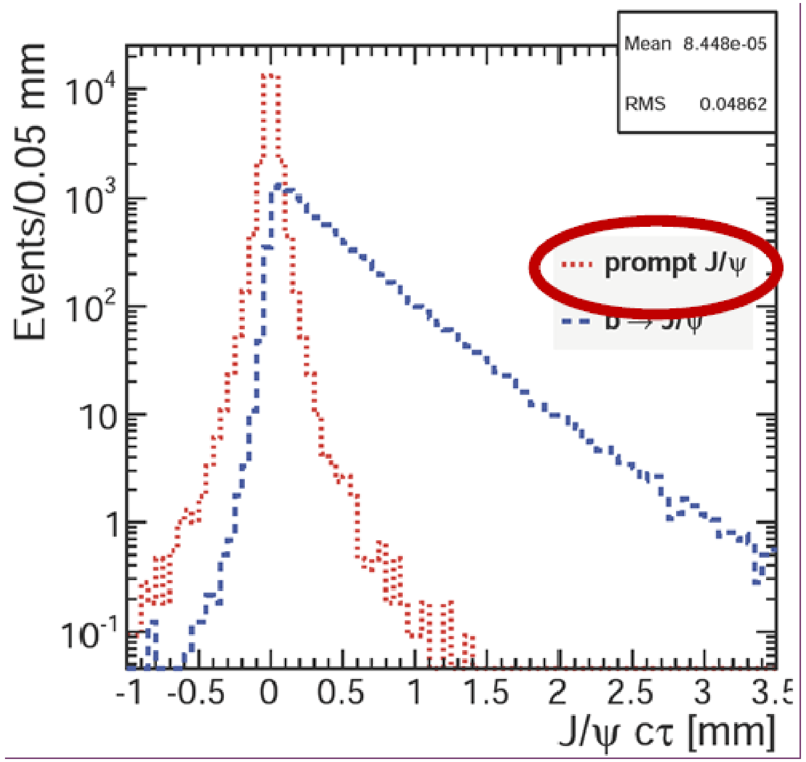
/BsToJPsiPhi_JPsiToMuMu_PhiToKK_SoftQCDnonD_TuneCP5_13TeV-pythia8-evtgen/RunIISummer20UL18RECO-106X_upgrade2018_realistic_v11_L1v1-v2/AODSIM

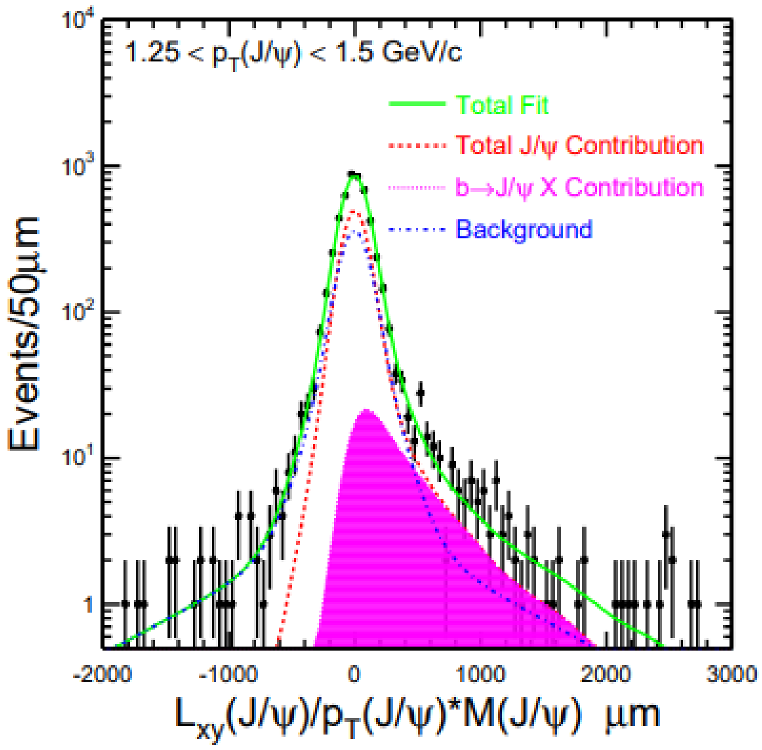




Compare to other result

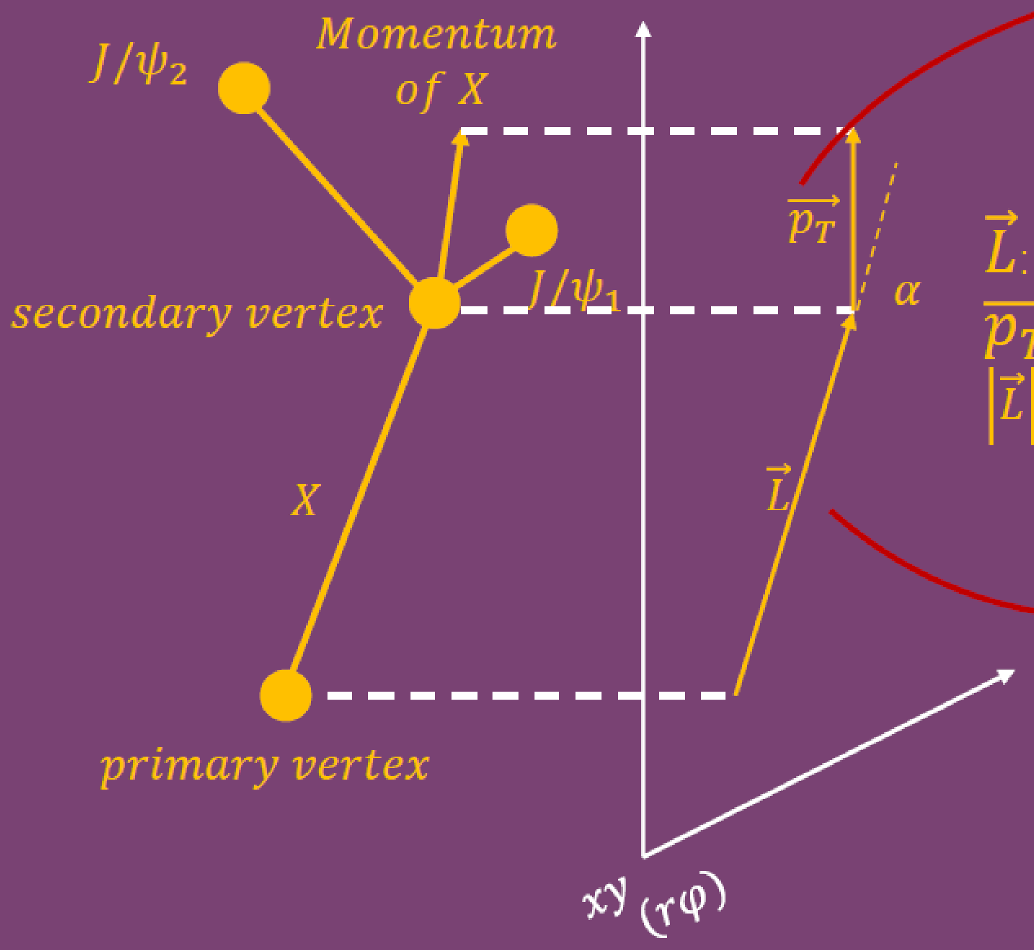






- Compare to other people's result, our Jpsi ctau and Lxy distribution are reasonable

Ntuple fragment about distance



$\vec{L}$: vdiff

$\overrightarrow{p_T}$: pperp

$|\vec{L}|$: distXY.value()

The L_{xy} is calculated as

$$L_{xy}(J/\psi) = \vec{L} \cdot \vec{p}_T(J/\psi)/|p_T(J/\psi)|, \qquad (22)$$

where $\vec{L}$ is the vector from the primary vertex to the J/ψ decay vertex in the r-ϕ plane and $\vec{p}_T(J/\psi)$ is the transverse momentum vector. To reduce the dependence on the J/ψ transverse momentum bin size and placement, a new variable x, called pseudoproper decay time, is used instead of L_{xy},

$$x = L_{xy}(J/\psi) \cdot M(J/\psi)/p_T(J/\psi), \qquad (23)$$

where the $M(J/\psi)$ is taken as the known J/ψ mass [22]. A

cosAlpha: $\cos\alpha = \vec{L}\cdot\overrightarrow{p_T} / |\vec{L}|\cdot|\overrightarrow{p_T}|$

lxy: $|\vec{L}|$

ctauPV: $x = |\vec{L}| \cdot \cos\alpha \cdot M(X)/|\overrightarrow{p_T}|$

$= \vec{L}\cdot\overrightarrow{p_T} / |\overrightarrow{p_T}| \cdot M(X)/|\overrightarrow{p_T}| = L_{xy} \cdot M(X)/|\overrightarrow{p_T}|$

lxyPV: $L_{xy} = \vec{L}\cdot\overrightarrow{p_T} / |\overrightarrow{p_T}|$