

J/psi event selection

◆ Data samples :

2010A /Mu/Run2010A-Nov4ReReco_v1/AOD
2010B /Mu/Run2010B-Nov4ReReco_v1/AOD

◆ Analysis code :

CMSSW_3_8_6 : PatTuples + TotoTuples

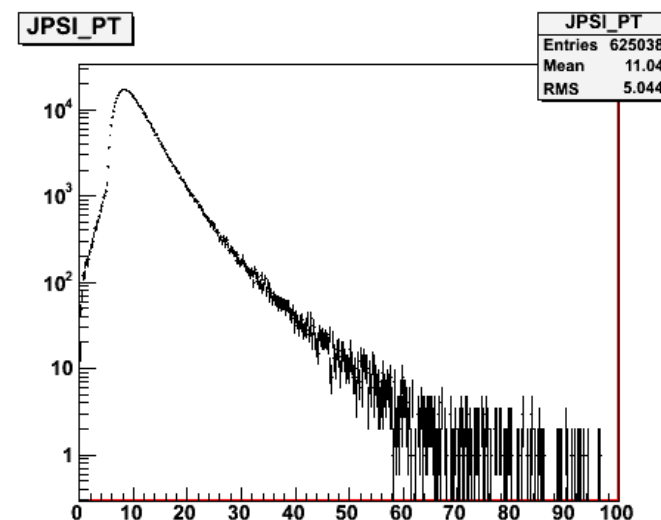
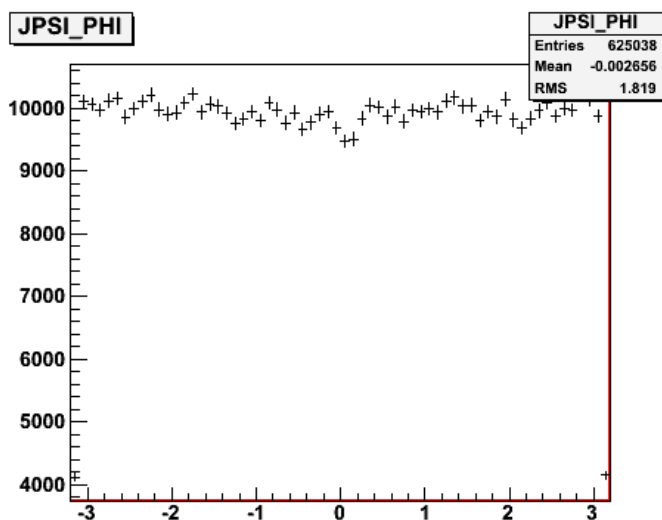
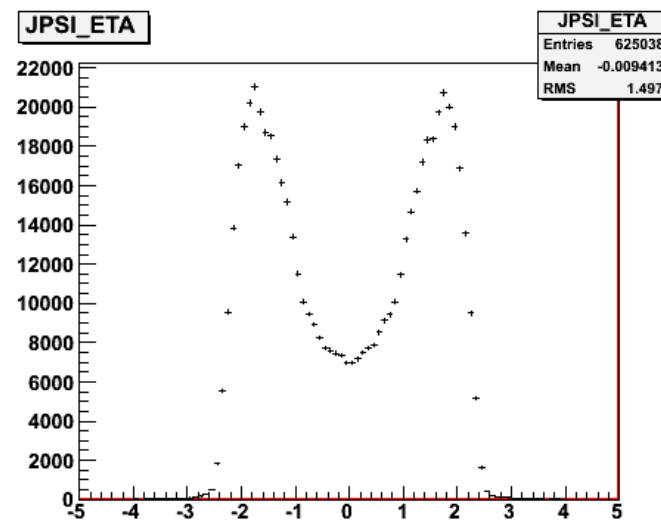
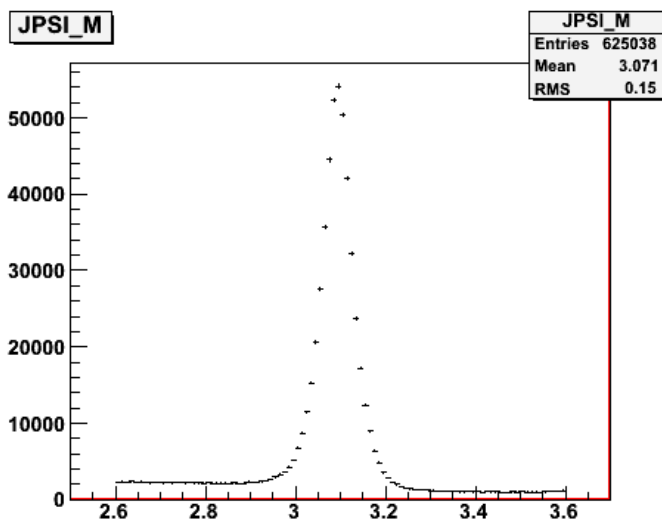
Working with “standard muons” : cleanPatMuons

Filter event before patTuple production requiring:

- ◆ At least one dimuon pair with $2.6 < M(\text{mumu}) < 3.6$ GeV
- ◆ Muons should just be “global muons”
- ◆ No trigger requirement (i.e. “OR” of all triggers of the MU stream)

J/psi offline analysis

- ◆ At least one good vertex
- ◆ J/psi muons :
 - 2 Global muons
 - Opposite sign
 - $2.6 < M(\text{mumu}) < 3.6 \text{ GeV}$
 - $|\Delta Z(\mu_1, \mu_2)| < 1 \text{ cm}$
- ◆ 625k J/psi candidates



J/psi mass and resolution vs eta (I)

J/psi mass for
 $1.0 < |J/\psi \text{ eta}| < 1.1$

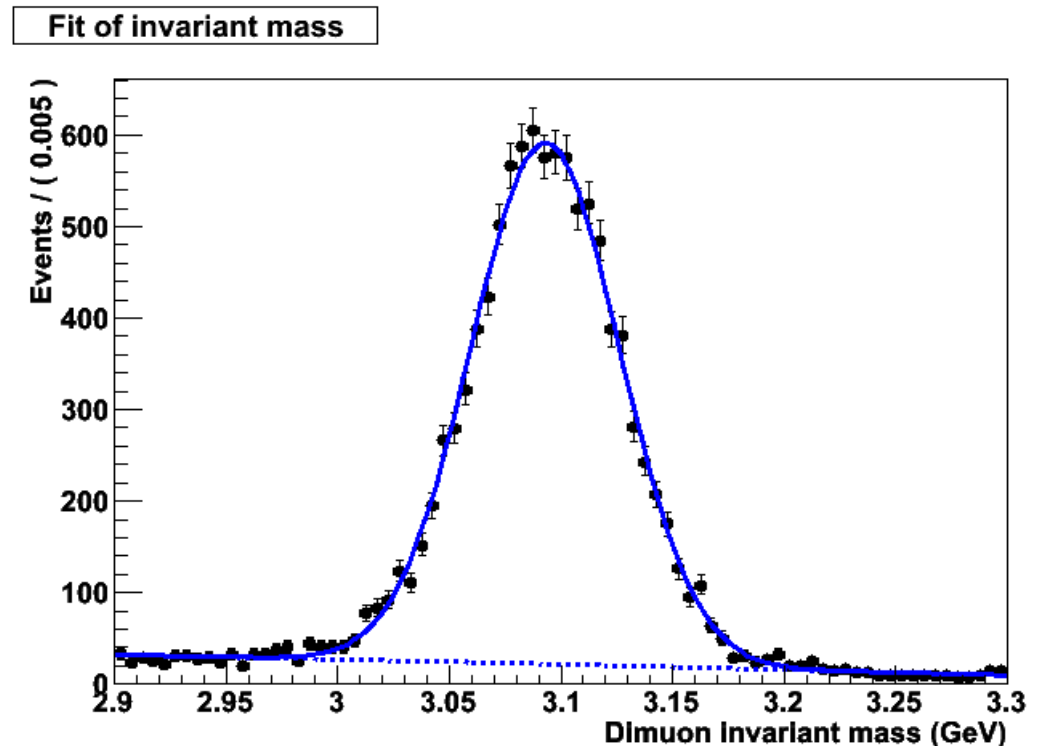
◆ Plot the J/psi mass for 50 bins of J/psi eta

◆ Very simple fit using RooFit:

Signal : Gaussian

Back. : Pol. ax+b

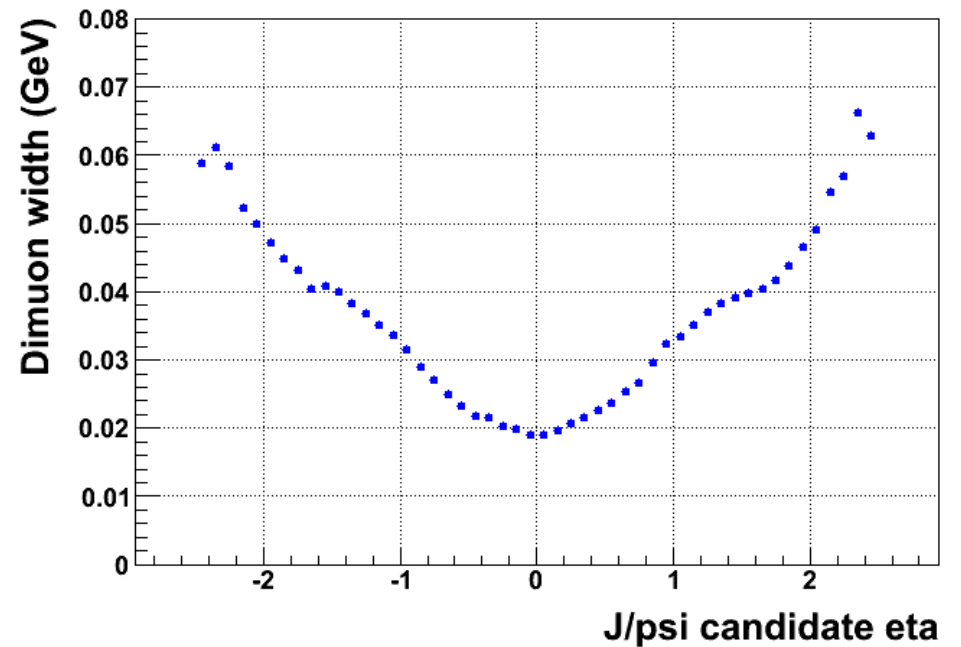
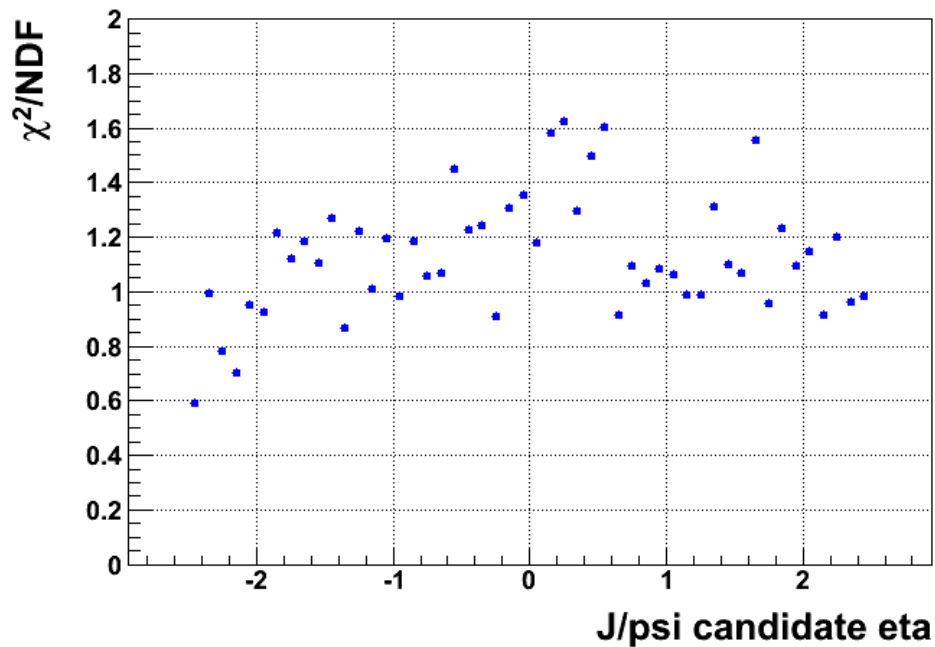
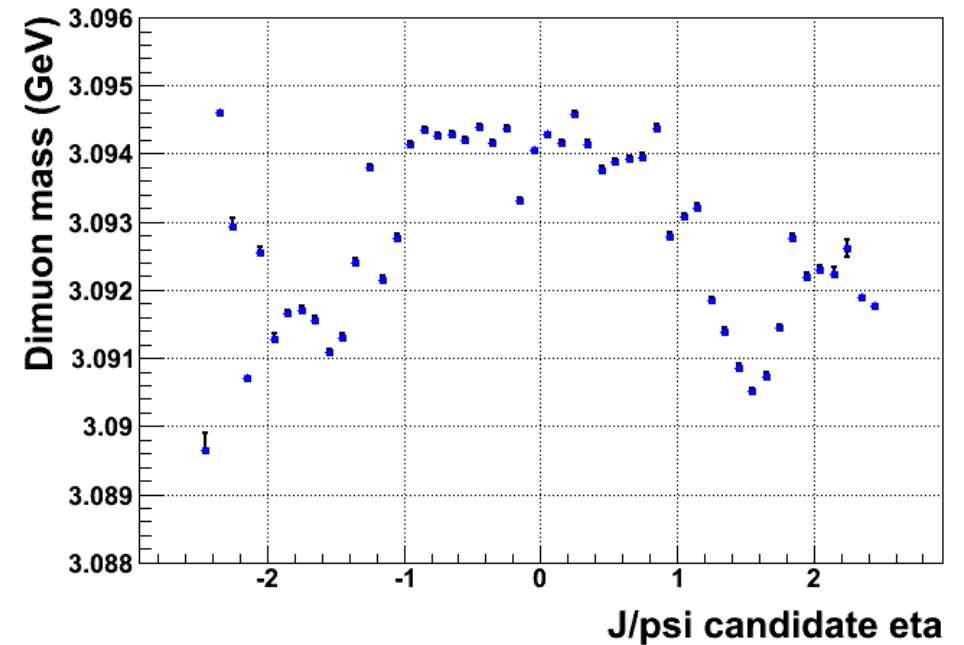
◆ Restrict the fit to $2.9 < M < 3.3$



J/psi mass and resolution vs eta (II)

◆ Results of the fits:

Difference between TEC+ and TEC- ?



J/psi muons isolation (I)

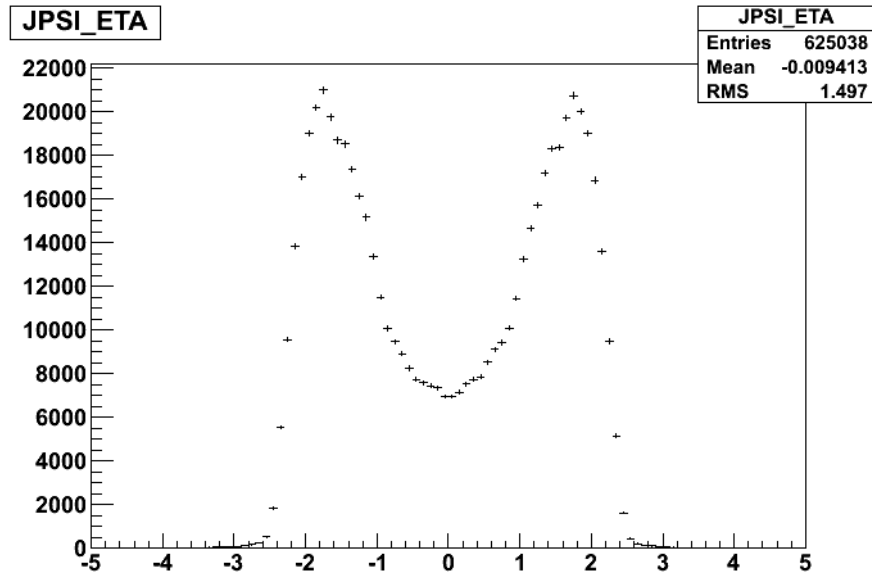
- ◆ I wanted to select J/psi with two perfectly isolated muons :

$$R_{\text{ellso}} = 1./(1. + (\text{tracklso} + \text{ecallso} + \text{hcallso}) / P_t)$$

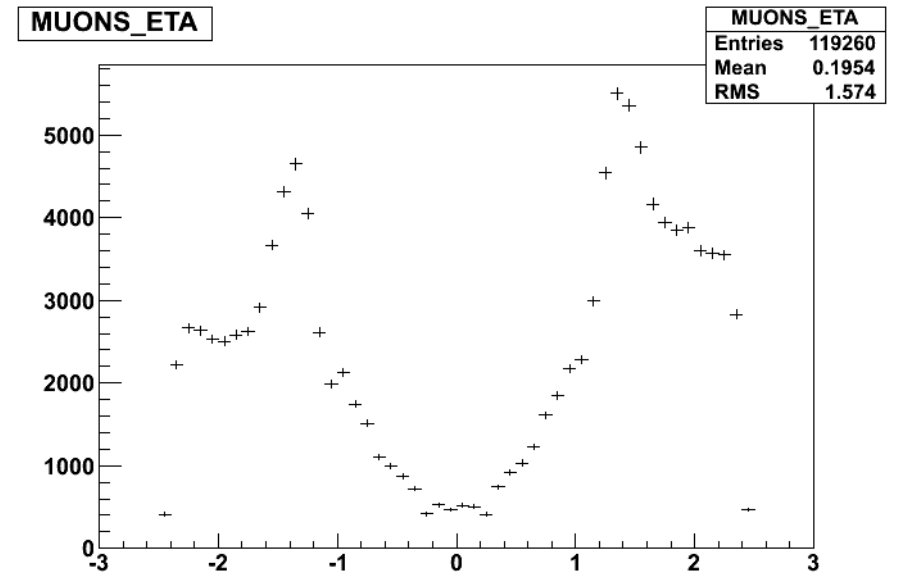
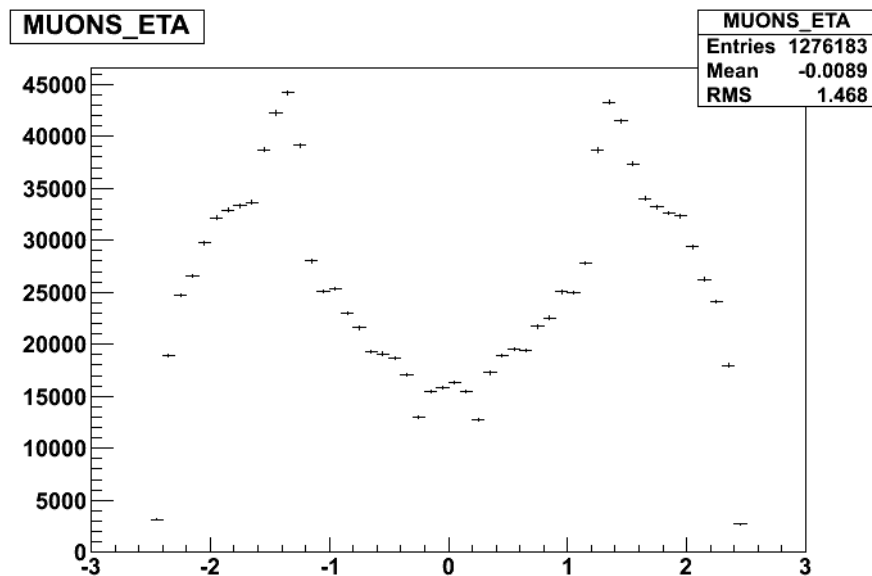
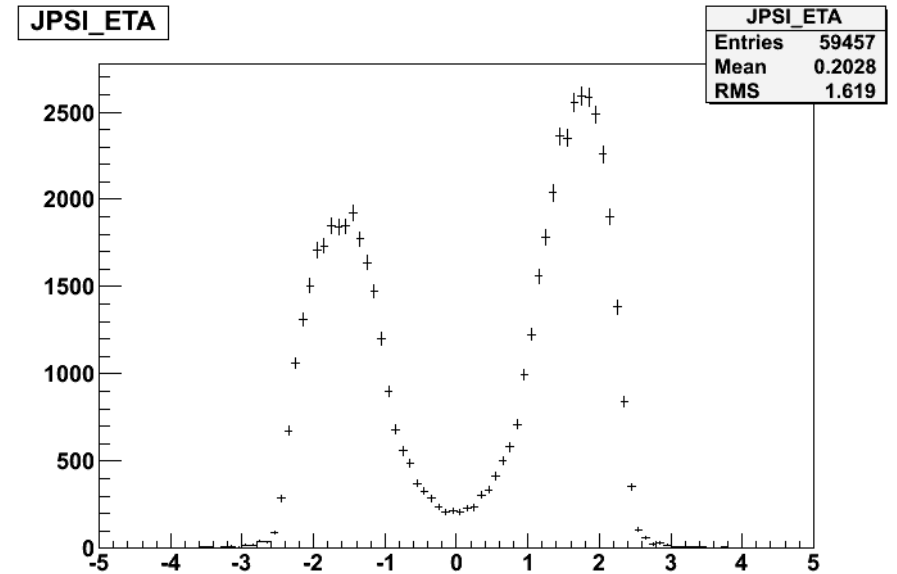
- ◆ And I stupidly required $R_{\text{ellso}} > 0.99$ for the 2 muons and I obtained the following distribution for the J/psi eta and muons eta :

J/psi muons isolation (II)

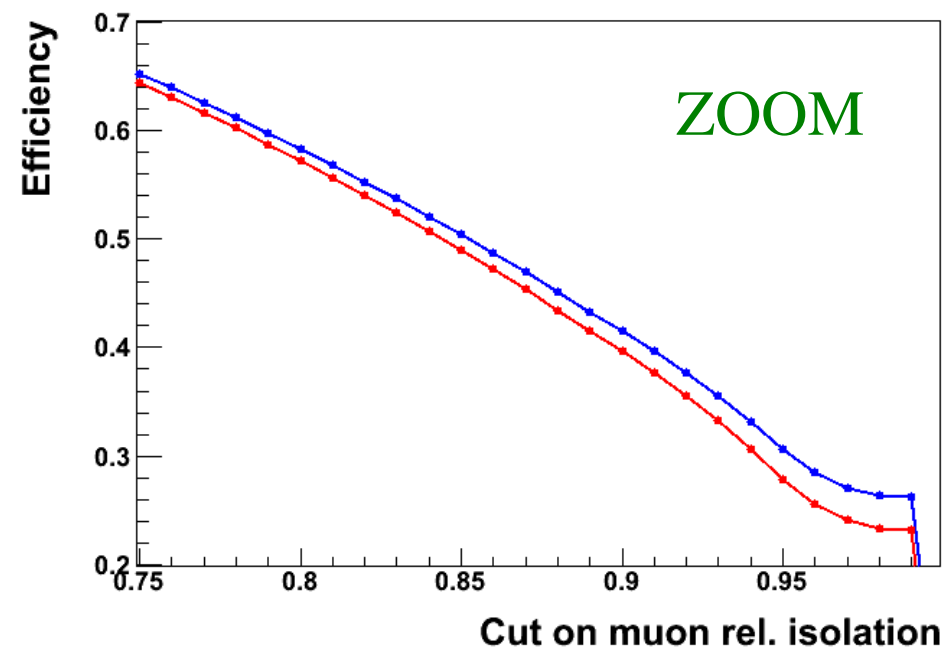
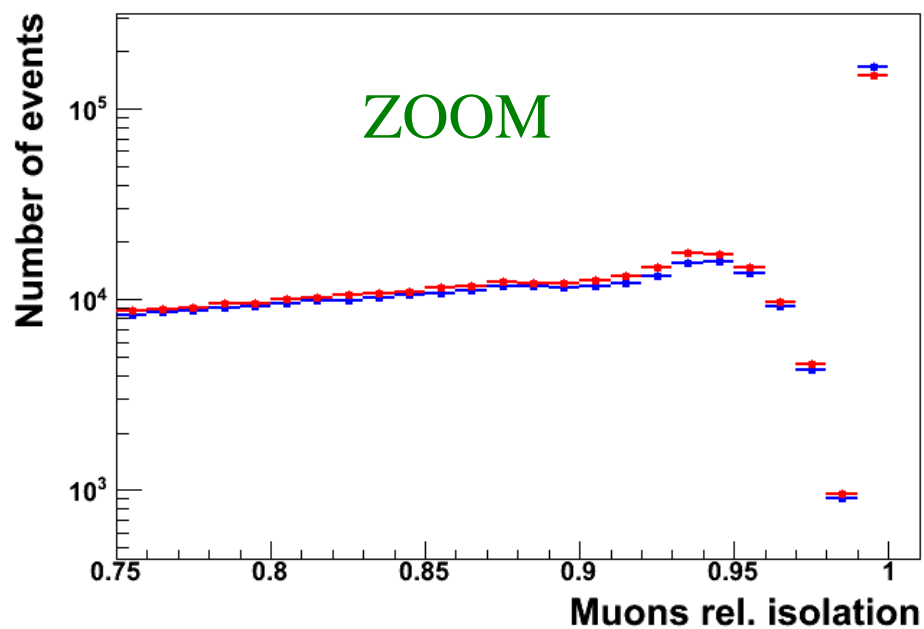
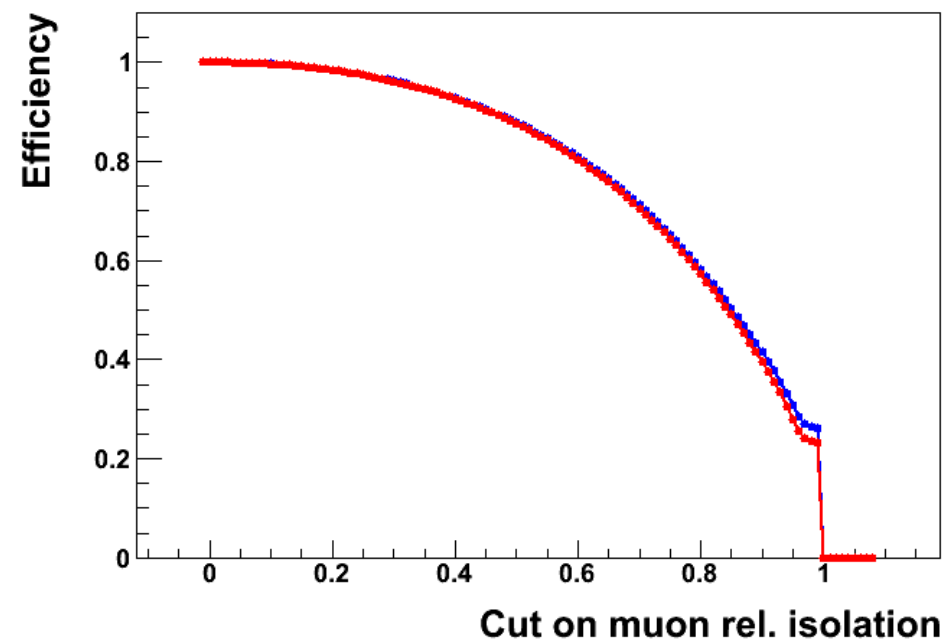
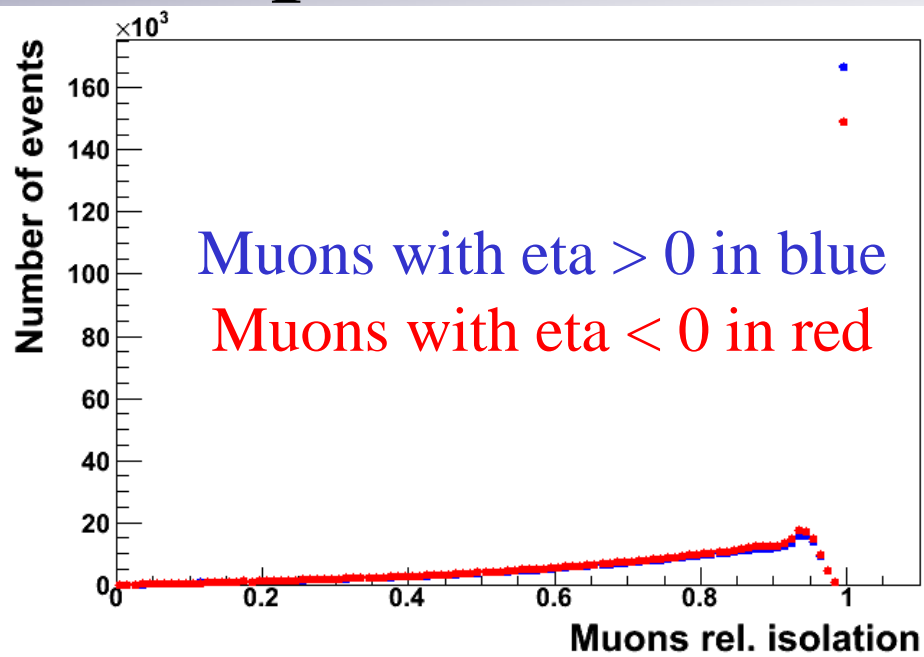
All J/psi muons: no isol. cut



J/psi muons : $RelIso > 0.99$



J/psi muons isolation (III)



J/psi muons isolation (IV)

- ◆ Efficiency of muon isolation cut is different for muons with $\eta > 0$ and $\eta < 0$
- ◆ Example : for a cut on $R_{\text{ellso}} > 0.9$:
 - Eta > 0 , efficiency = 41.5%
 - Eta < 0 , efficiency = 39.7%
- ◆ Effect also seen in muons from Z : need to finalize that study