



Weekly

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Status

- ❖ **3.2 + 2.6 fb⁻¹ ntuples ready;**
- ❖ **Fully migrated to v14:**
 - new overlap removal;
 - trigger match doesn't work;
 - some dsids missing;
 - seems some problem with MC weights;
- ❖ **Jet fakes excess in emu partially fixed?**
- ❖ **Pheno side: fake background first estimated.**

jet fakes updated again..

❖ For emu channel, id+antiid can have jet fakes, first need subtract them;

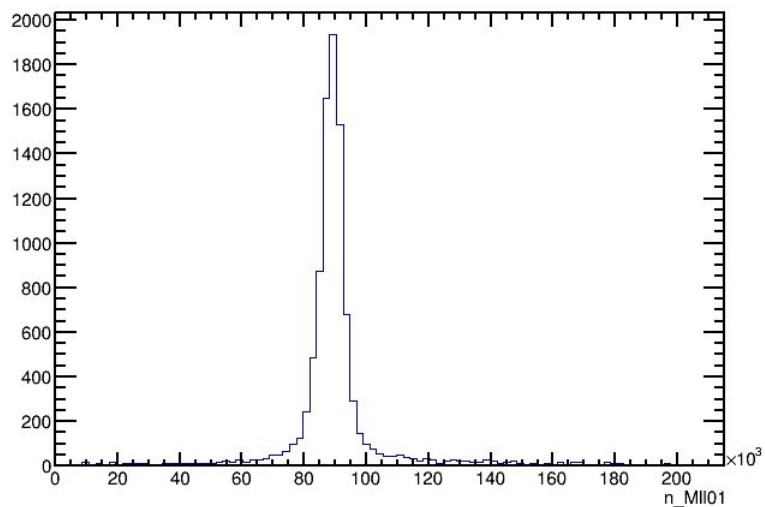
$$N_{\text{jet fakes}}^{e\mu} = (== 3 \text{ jets})(e\mu - \epsilon\mu \times f_e - Q_{\text{misID}} - \text{promptSS}) \times f_\mu + (== 3 \text{ jets})(\epsilon\mu - \epsilon\mu \times f_\mu - Q_{\text{misID}} - \text{promptSS}) \times f_e$$

	ee	mumu	emu
data	150	66	78
QmisID	15.8	~	19.1
prompt SS	10.1	12.4	20.1
jet fakes	117.5	47.0	56.1
(data-bkg)/bkg	6.0%	11.1%	-18.2%

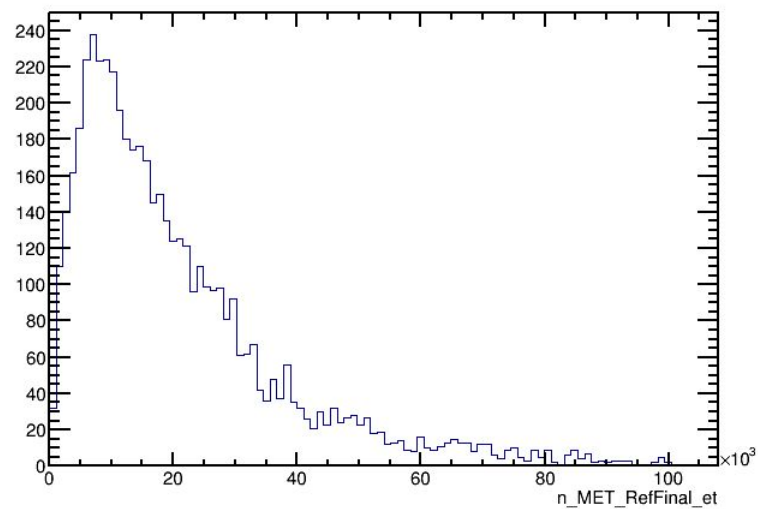
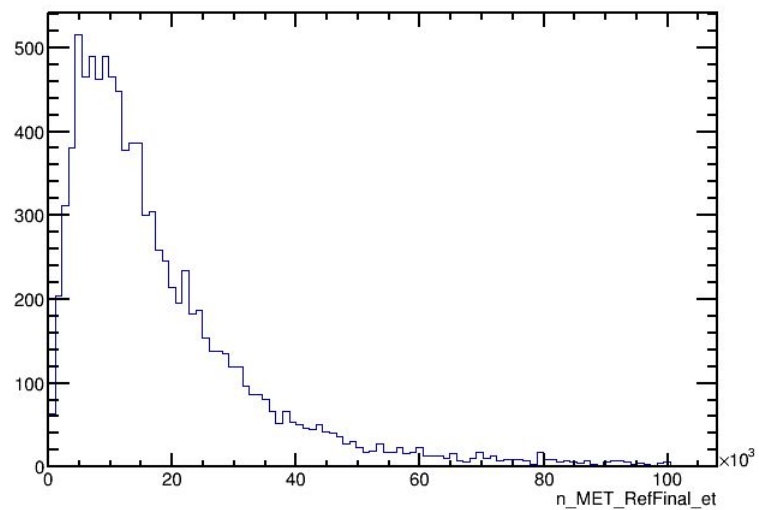
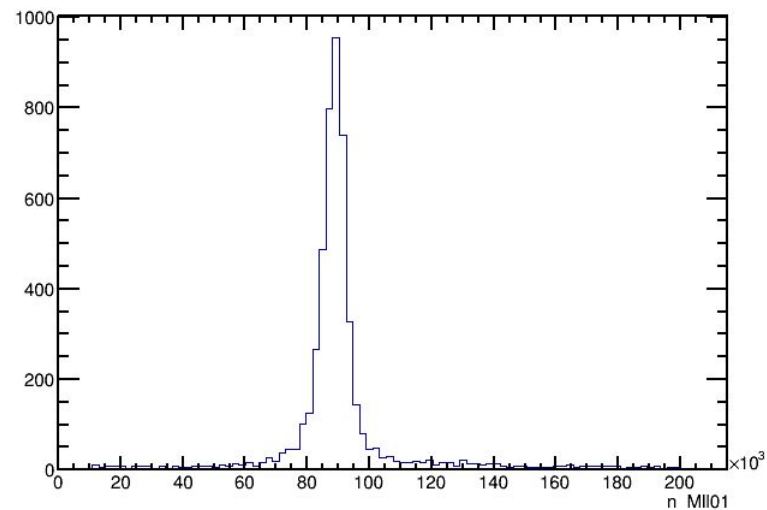
	ee	mumu	emu
data	150	66	78
QmisID	15.8	~	0.03
prompt SS	10.1	12.4	20.1
jet fakes	117.5	47.0	56.1
(data-bkg)/bkg	6.0%	11.1%	-2.3%

data15 vs data16

3.2 fb⁻¹



2.6 fb⁻¹



Fake backgrounds

❖ CERN-OPEN-2008-020

- QmisID: $f(\text{ele}) = 1e^{-3}$; $f(\text{mu})=1e^{-5}$
- light jet fake rate: $f(\text{ele})=6.7e^{-5}$; $f(\text{mu})=1.7e^{-5}$;
- b jet fake rate: $f(\text{ele}/\text{mu})=5e^{-3}$

❖ Details:

- To be comparable with prompt SS bkg, fake rates are applied after selecting corresponding final states of bkg process; Eg: `ttbar_semilep`, 10k were generated, after object definitions and overlap removal, selected 2k events with one lepton and ≥ 4 jets(including b jets). So $\text{xsec}(\text{fake_ttbar_semilep})=\text{xsec}(\text{ttbar})*(2k/10k)*\text{fake rate}$
- $\text{xsec}(\text{fake_W}+5\text{jets})=\text{xsec}(\text{W}+4\text{jet})*(\text{xsec}(\text{W}+4\text{jet})/\text{xsec}(\text{W}+3\text{jet}))$

H300

❖ Lumi=300 fb⁻¹

processes	xsec(fb)	basic cuts + event selection	b-veto	pt_l1 > 25GeV met>20	m_ljjljj < 350GeV
Hhh300	11.4	1.40	1.23	0.86	0.50
ttW	28.4	4.61	0.56	0.52	0.03
WW4j	19.6	2.74	2.43	2.28	0.015
tth	12.6	2.00	0.28	0.25	0.02
Whjj	3.9	0.28	0.24	0.21	0.02
WZ4j	155	14.1	12.6	10.2	0.11
Fake	Z + 4 jet	3.48			
	W + 5 jet	22.3			
	ttbar - semilep	724.7			
	ttbar-fullep	0.23			
S/sqrt(B)	~	0.87			
Z ₀	~	1.0			

To do list

- ❖ **Figure out MC weights in v14 ntuples;**
- ❖ **Estimate fake factor with $3.2+2.6^{-1}$ fb;**
- ❖ **pheno side:**
 - fake estimations completed next week;
 - interpretations
- ❖ **QT:**
 - check associated tracks

Back up

TEVATRON $\sqrt{s} = 1.96$ TeV	$\sigma_{t\bar{t}j}^{\text{NLO}} / \sigma_{t\bar{t}}^{\text{NLO}}$	LHC $\sqrt{s} = 14$ TeV	$\sigma_{t\bar{t}j}^{\text{NLO}} / \sigma_{t\bar{t}}^{\text{NLO}}$
$p_T \geq 20$ GeV	30%	$p_T \geq 50$ GeV	47%
$p_T \geq 40$ GeV	11%	$p_T \geq 100$ GeV	22%

TEVATRON $\sqrt{s} = 1.96$ TeV	$\sigma_{t\bar{t}jj}^{\text{NLO}} / \sigma_{t\bar{t}}^{\text{NLO}}$	LHC $\sqrt{s} = 7$ TeV	$\sigma_{t\bar{t}jj}^{\text{NLO}} / \sigma_{t\bar{t}}^{\text{NLO}}$
$p_T \geq 20$ GeV	4%	$p_T \geq 50$ GeV	6%
$p_T \geq 40$ GeV	1%	$p_T \geq 100$ GeV	1%