Weekly

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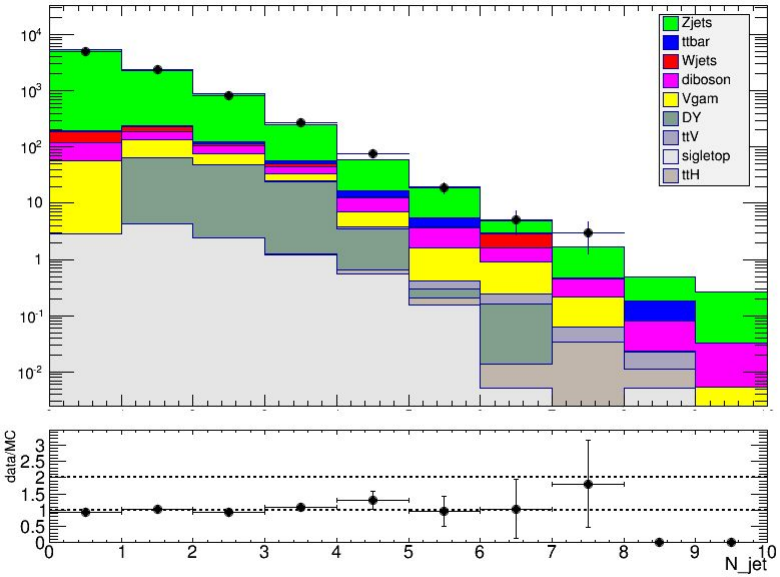
samples status

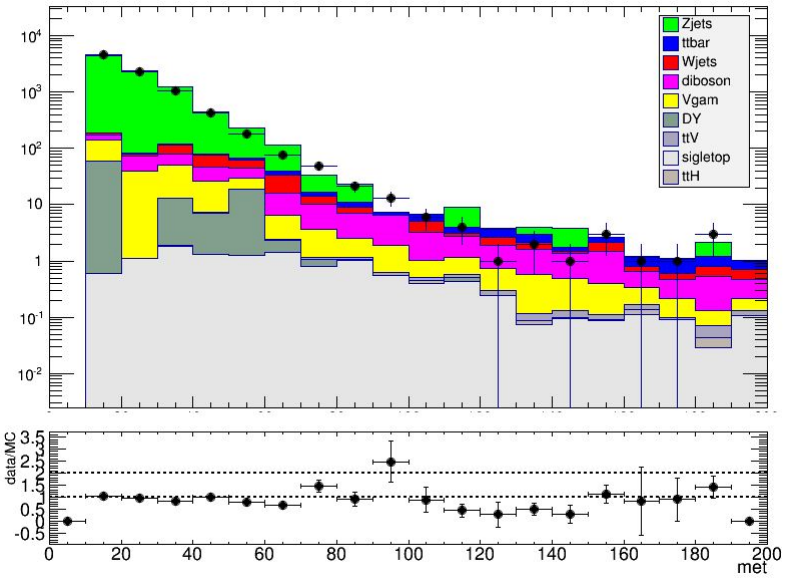
- Mini ntuples: /afs/cern.ch/user/m/mzhou/work/public/ntuples;
  - Object defitions;
  - Overlap removal;
  - Exactly two SS loose leptons;
  - B veto
- Will migrate to v7, following ttH ntuples production;

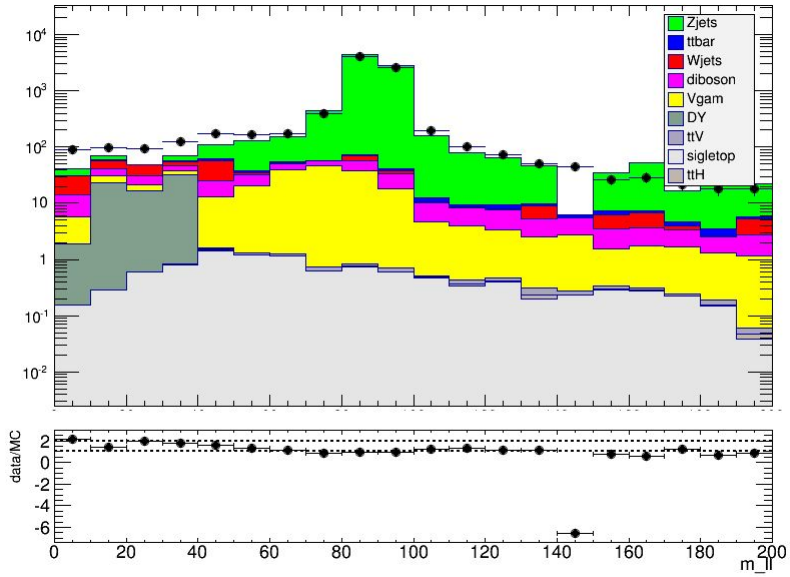
- Signal samples: Biagio will produce validation samples this week (again..)

data/MC

- 2 tight SS leptons;
- MET > 10GeV;
- ee channel review, quite good

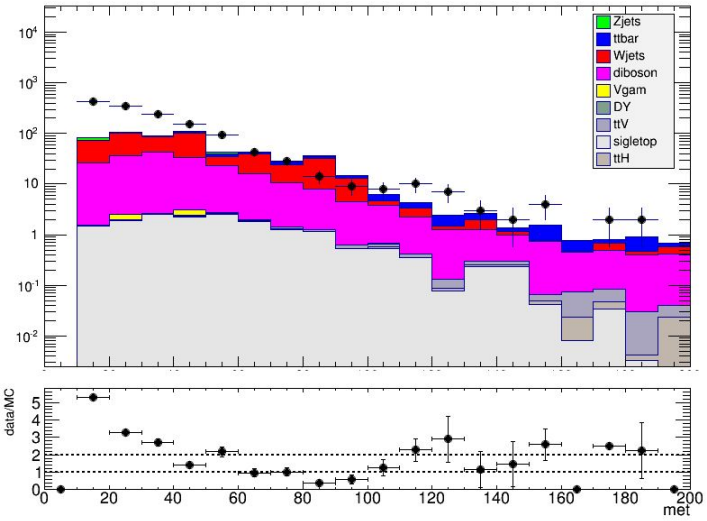


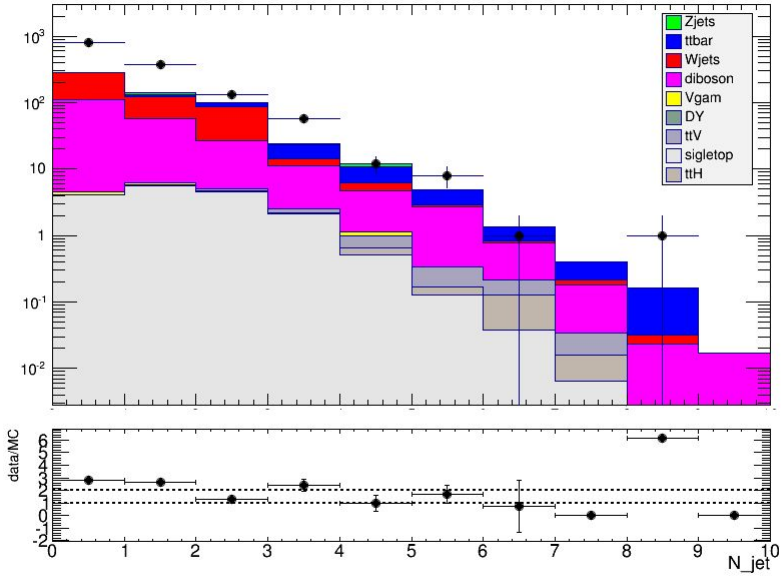


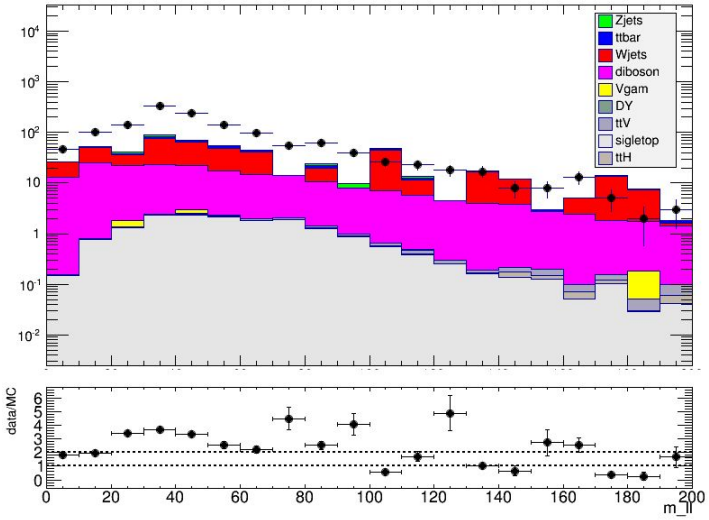


mumu channel

- data/MC agreement ugly;
- W jets dominate in low jet multiplicity region;
- ttbar dominate in high jet multiplicity region；
- VV contribute full region.

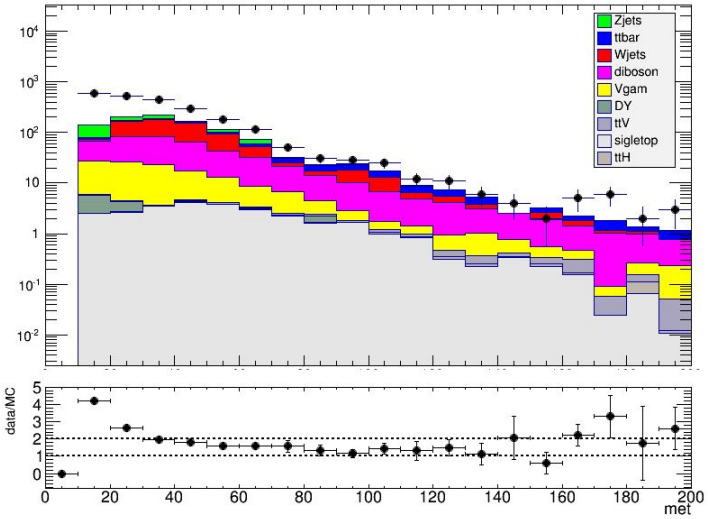


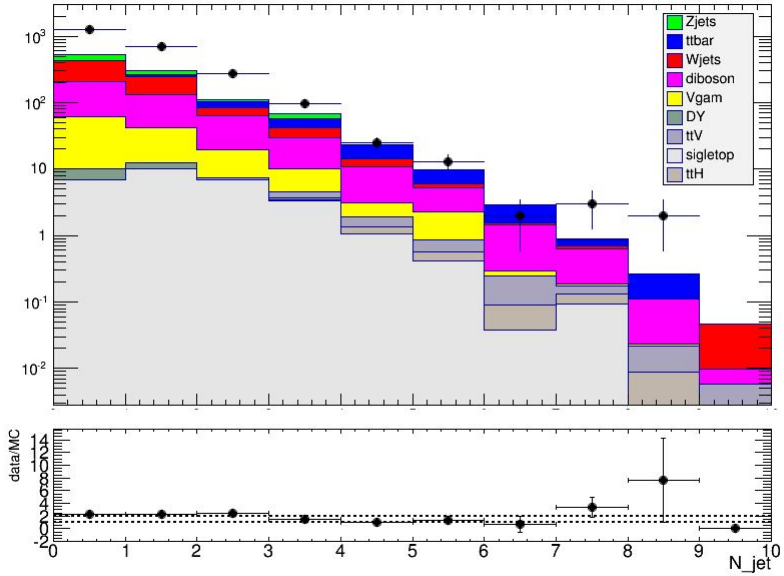


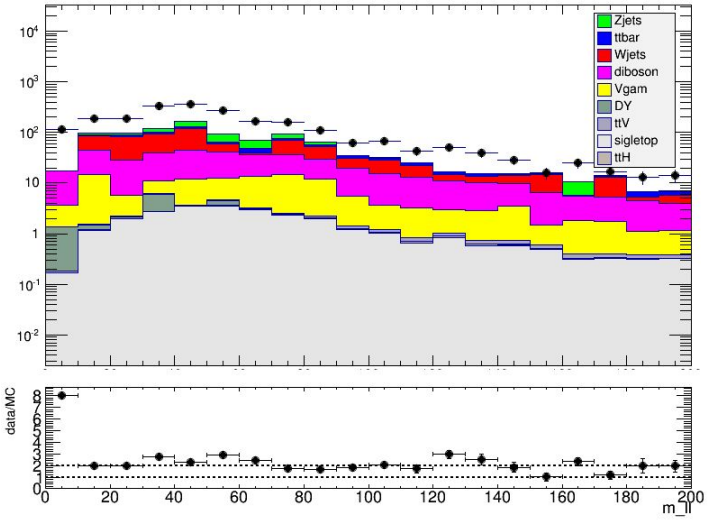


emu channel

- data/MC agreement ugly;
- W jets dominate in low jet multiplicity region;
- ttbar dominate in high jet multiplicity region;
- VV contribute full region;
- Vgam jumps in, 'cause of photon conversion

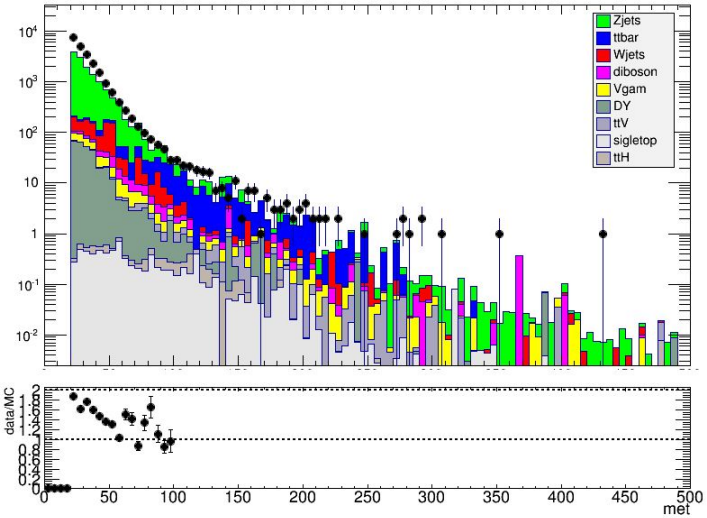


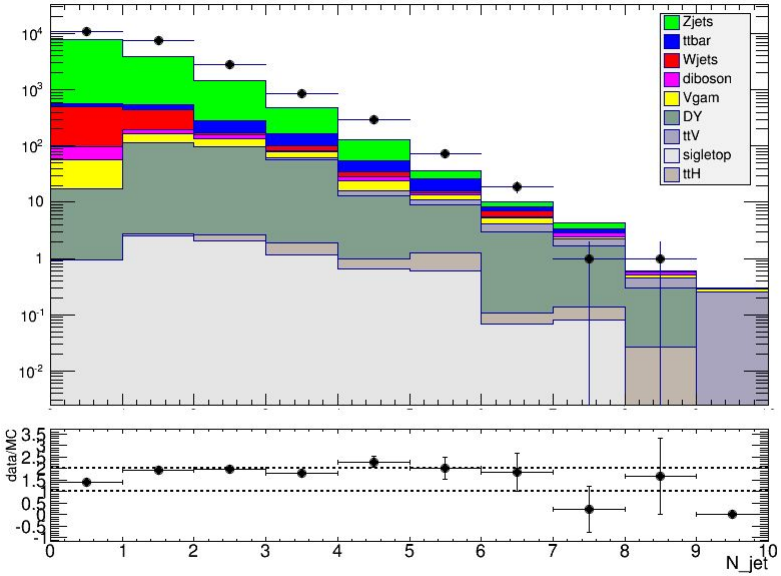


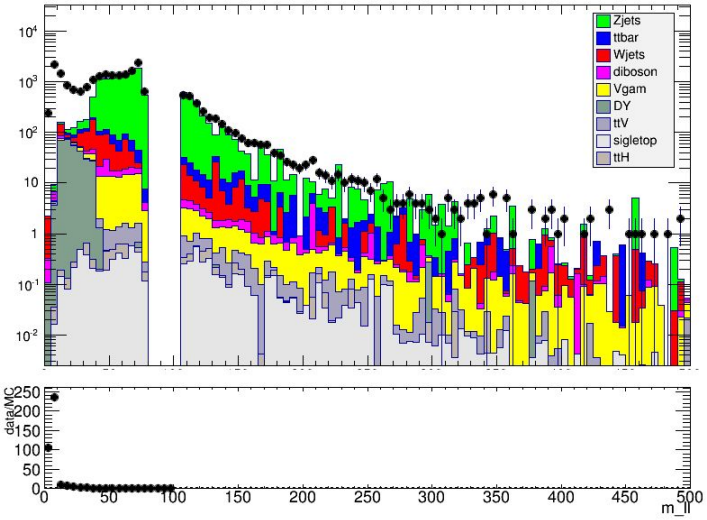


OS

- exactly two OS leptons;
- one tight(id), one loose(antiid);
- |m_ll -91| > 15GeV;
- MET > 20GeV;
- ee channel
- ugly!







fakes estimation

- data-driven method:

$$\theta_e = \frac{N_{ee}}{N_{e\not{e}}}(\leq 4\text{jets}) = \frac{N_{ee}^{Data} - N_{ee}^{\text{Prompt SS}} - N_{ee}^{\text{QMisId}}}{N_{e\not{e}}^{Data} - N_{e\not{e}}^{\text{Prompt SS}} - N_{e\not{e}}^{\text{QMisId MC}}}$$

$$\theta_\mu = \frac{N_{\mu\mu}}{N_{\mu\not{\mu}}}(\leq 4\text{jets}) = \frac{N_{\mu\mu}^{Data} - N_{\mu\mu}^{\text{Prompt SS}}}{N_{\mu\not{\mu}}^{Data} - N_{\mu\not{\mu}}^{\text{Promt SS}}}$$

$$N_{ee}^{fakes}(\geq 5\text{jets}) = (N_{e\not{e}} - N_{e\not{e}}^{\text{Prompt SS}} - N_{e\not{e}}^{\text{QMisId MC}})(\geq 5\text{jets}) \times \theta_e$$

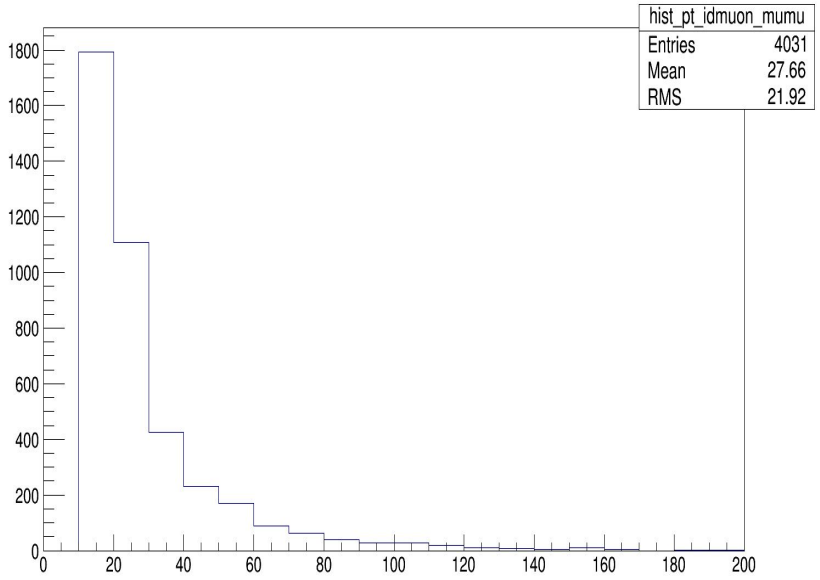
$$N_{\mu\mu}^{fakes}(\geq 5\text{jets}) = (N_{\mu\not{\mu}}^{Data} - N_{\mu\not{\mu}}^{\text{Prompt SS}})(\geq 5\text{jets}) \times \theta_\mu$$

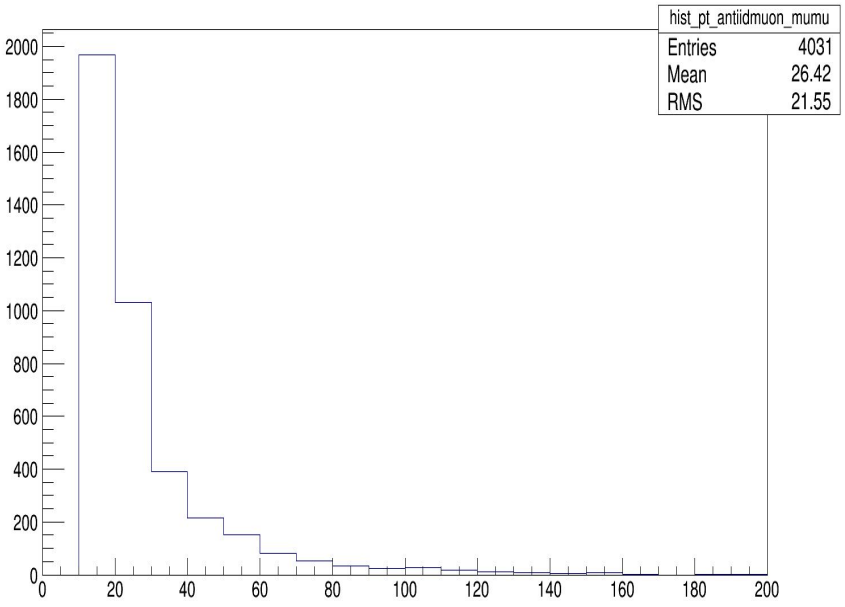
$$N_{e\mu}^{fakes}(\geq 5\text{jets}) = N_{e\not{\mu}}(\geq 5\text{jets}) \times \theta_\mu + N_{\mu\not{e}}(\geq 5\text{jets}) \times \theta_e$$

- In our case, three regions are involved:
  - SS id+antiid, <=3 jets;
  - SS id+id, <=3 jets;
  - SS id+antiid, >=4 jets
- Prompt SS: VV, tV, ttV, ttH
- For ee channel, Z peak veto will be applied.

Look at mumu channel -I

- Since QMisID rate is not available， first look at mumu channel i n which charge flip could be ignored;





Look at mumu channel-II

- 0< #jet <=3, met > 10GeV;

	data	VV	tV	ttV	ttH
id+id	330	23.95	1.04	0.23	0.04
id+antiid	2130	36.88	9.90	0.29	0.08

- #jet >=4, met > 10GeV;

	data
id+antiid	107

- F.F. = 0.15
  - mumu in ttH, b jet required; $\theta^{\mu}_{\text{data}}(234) = 0.298 \pm 0.118(\text{stat.})$
- N_fakes in SR for mumu = 16.05

to do list

- Estimate ee, emu when QMisID rate avaliable;
- fake factor method validation with emu channel;
- Uncertainty estimation
  - stat: CR, fake factor;
  - QmisID;
  - fake sample compositions
- If statistics increase later, extropolate to fake shape estimation:
  - calculate F.F. for each bin of pT, eta, m_ll or mT;
  - implement F.F. to fakes CR to get shape predictions in SR

Backup