Alpgen samples: matching parameters

- Alpgen matches partons (generation level) with parton jets (after showering, before hadronization), to avoid double counting

- At a glance:

  1. Generate events for given process and multiplicity with certain cuts (on pT and ΔR among other cuts)
  2. Perform parton shower (eg, with Pythia)
  3. Run jet (cone) algorithm before hadronization (makes parton jets); three parameters: RJET=0.4,EJCUT=15GeV,ETAJCUT=3.0 (for example)
  4. Match partons (step 1) with jets (step 3)
     exclusive: each parton is matched to one jet and vice versa
     inclusive: each parton is matched to a jet (not matched jets may exist)
  5. Combine samples with different multiplicities (exclusive for last multiplicity bin)

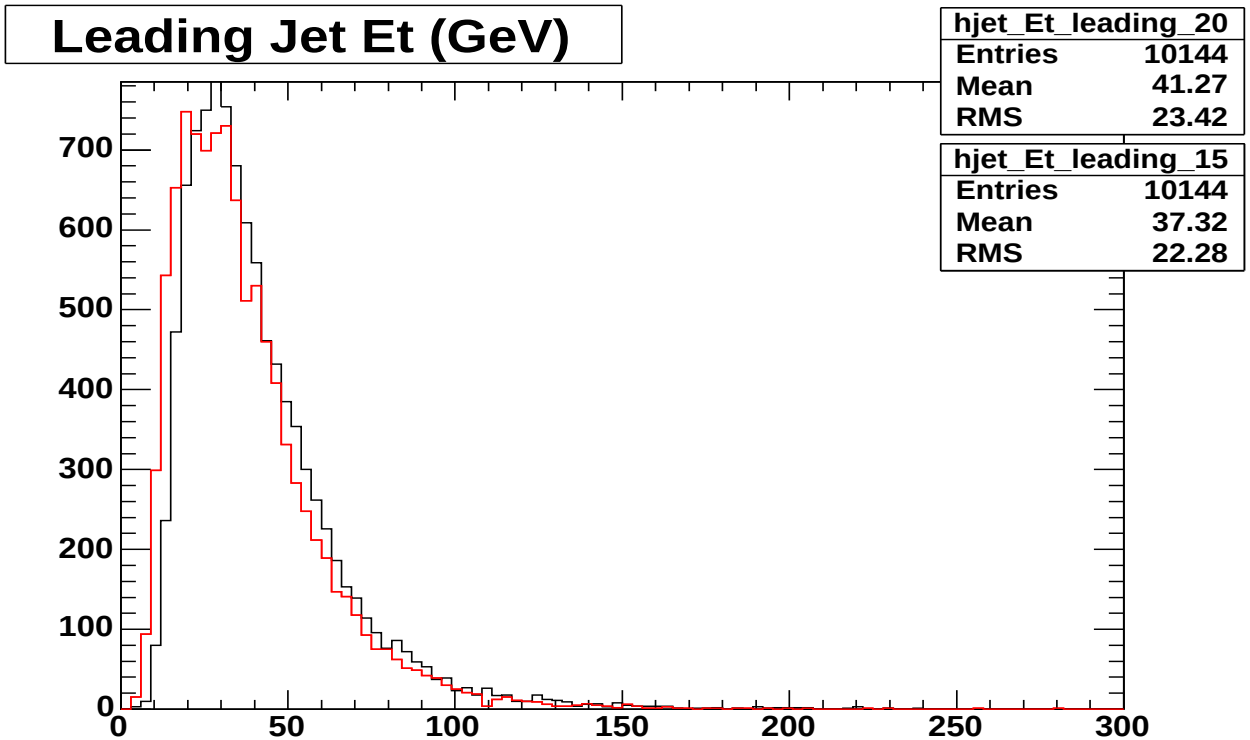
- Both generation and matching parameters have been changing a lot (Mangano sends his latest best code and CDF follows)
- Some parameters:

	ptjmin	ptlmin	ptbmin	Metmin	etclus
Gen 5 (ltopXb)	8	1	8	1	8?
Gen 6 (ptopXb)	15	1	0	0	15 (20)

- 20 GeV is the new value for ETCLUS (was 15), which means that parton jets below 20 GeV will not be reconstructed, so it will not be matched to a parton $\Rightarrow$ expect less events a higher multiplicities
- Ingyin noticed the above and also noticed that previous Gen 6 matching (PTJMIN=ETCLUS=15) compares better to data
- We generated samples to look at the effect of diff matching parameters

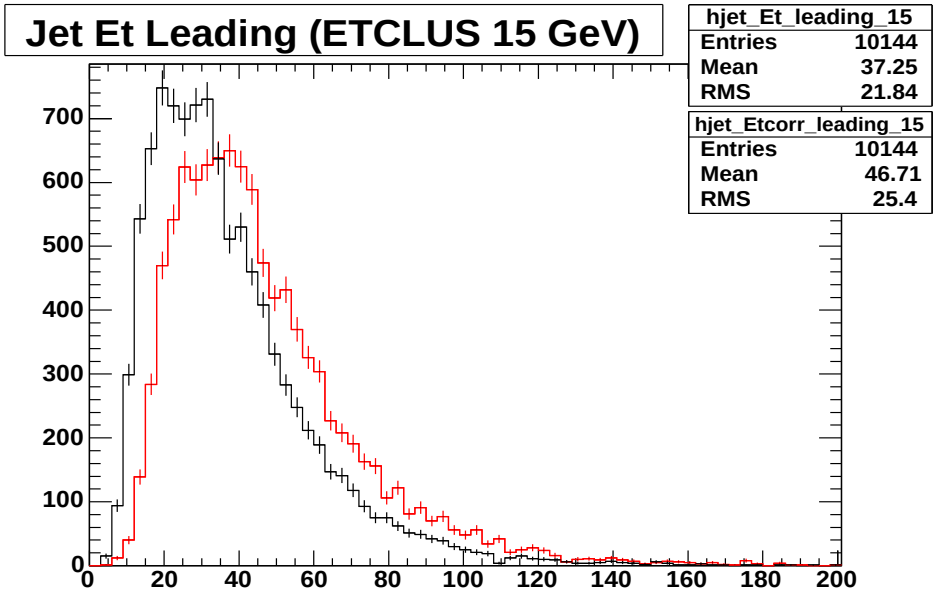
- alpsho.f actual code: ETCLUS=MAX(PTJMIN+5,1.2*PTJMIN)
  Not a parameter!

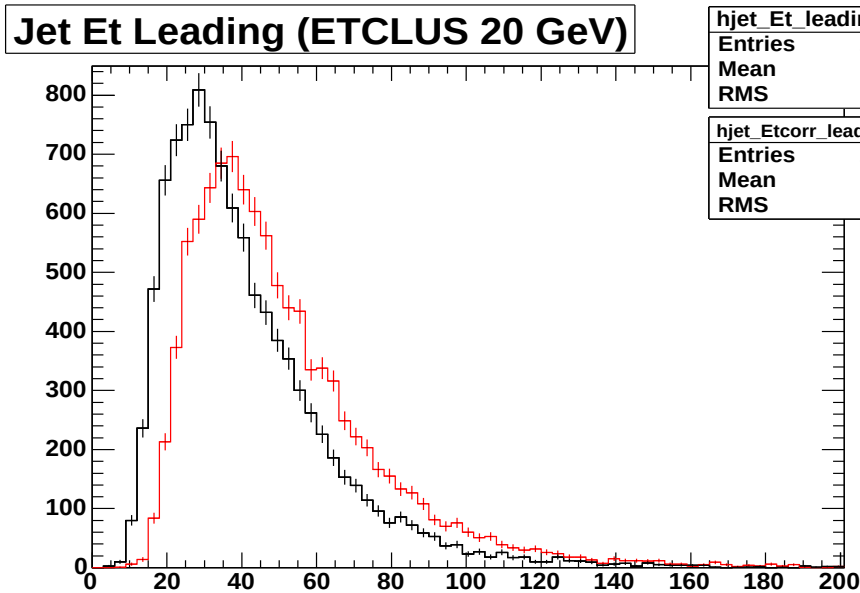
- W+bb+1p, ETCLUS=15 GeV (red), ETCLUS=20 GeV (black), uncorrected leading jet Et



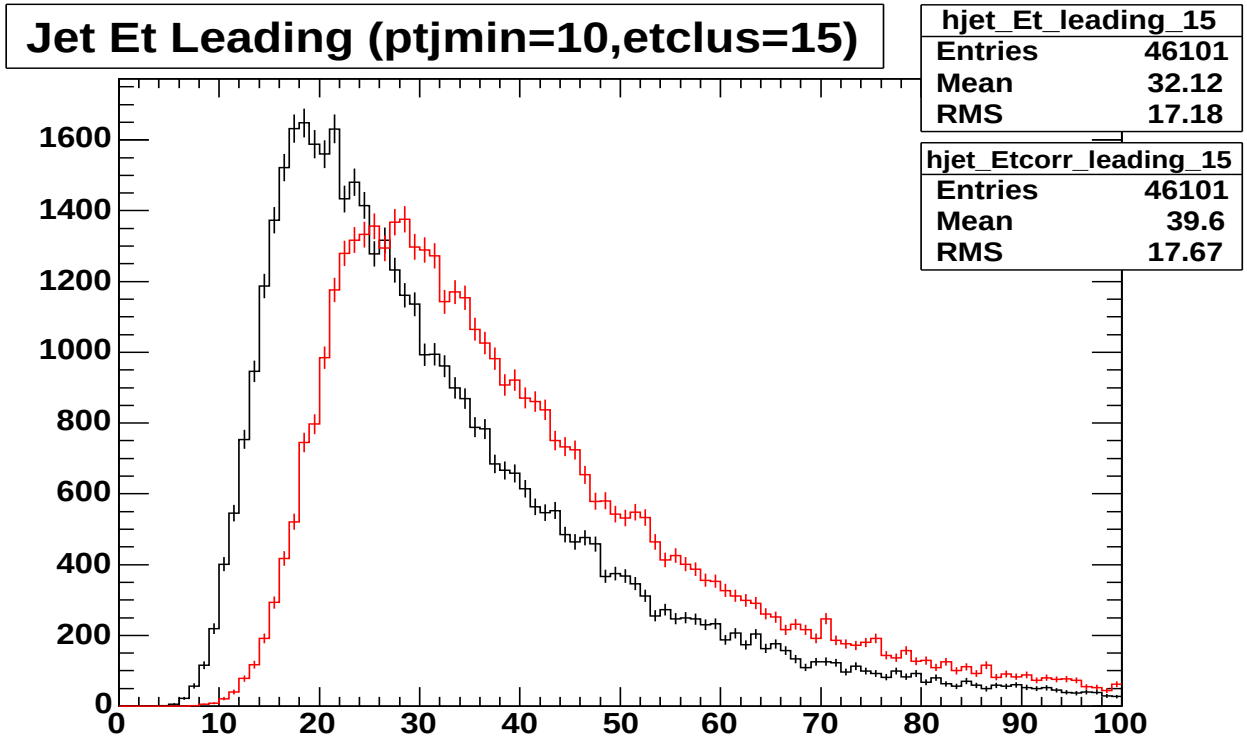
- Dip in ETCLUS=15: not nice

- Left ETCLUS=15 GeV (with and without JES corr), right ETCLUS=20 GeV





- Given that (15,15) agrees better with data (see Ingyin's plots) but is has a dip in the uncorrected Et spectrum (and (15,20) does not), made some Z samples with (10,15) to look at.

- ptop5z, ptop6z, ptop7z: OK (Z+0,1,2p)
  ptop8z, ptop9z: failed (time limit)
  Re-running (Andrew is making (15,15))

- ETCLUS=10 GeV, ETCLUS=15 GeV (Z+2p, ptop7z)