Stripping
Jets in the data after mid of August

DØ Collaboration Meerting, QCD Group

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Stripping

http://www-hep.fzu.cz/~kupco/phd/data/strip.html

Stripped files

Stripping is based on selection of L3bits and L3MarkPass. In the first stage all events that passed any of the jet trigger is accepted. Moreover also events that passed muon only trigger (ie. just muon(s) + no jet trigger) and that have some jet are also accepted. In the next step the size of the root-tuple is reduce by selection of the branches. Basically all jet branches are kept, plus MET, PVSEL, NADA, and EVENT.

Trigger	D0Release	Files	Runs	Run range	Events	Size	Location
3.%	p10.14.01	374	131	141737-145216	1546095	8.7GB	clued0:/w
4.%	p10.14.01	245	12	145890-147355	772176	4.7GB	kozel-clue
4.%	p10.15.00	583	54	146338-147995	2902718	19GB	kozel-clue
4.%	p10.15.01	681	64	145684-149210	2174925	14GB	kozel-clue
5.%	p10.15.01	1838	196	149269-153448		26+9GB	kozel-clue
5.%	p10.15.02	280	26	149932-154492		4.8+2.5GB	kozel-clue
v7.40_noL2MU	p11.09.00	3743	143	158535-160554	3566158	24GB	clued0:/w
CMT-8.10	p11.11.00	1553	103	161101-162351	1118370	8.7GB	kozel-clue
CMT-8.20	p11.11.00+p11.12.01	5528	176	162458-164321	5546195	39GB	clued0:/w
CMT-8.30	p11.12.01	1787	63	164380-165233	1861276	13GB	clued0:/w

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Last update 2nd Oct 2002 by AK.

Run	N_{orig}	Nevt	good LBN Nevt	mbias Lum	mbias Nevt	mbias xsec	JT_95TT Lum	JT_95TT Nevt	JT_95TT xsec
164382	34769	16476	15292	0.0124 ub^{-1}	370	29.8 mb	12.6 nb^{-1}	123	14.1+-1.5 nb
164383	29281	13967	12858	0.0105 ub^{-1}	323	30.8 mb	10.6 nb^{-1}	75	9.9+-1.3 nb
164385	159365	76282	72423	0.0581 ub^{-1}	1866	32.1 mb	60.7 nb^{-1}	438	9.7+-0.5 nb
164387	235598	115049	107524	0.0938 ub^{-1}	3124	33.3 mb	82.4 nb^{-1}	548	8.6+-0.4 nb
164389	262773	135843	131317	0.112 ub^{-1}	3859	34.5 mb	89.4 nb^{-1}	606	8.5+-0.4 nb
164390	71523	36143	33865	0.0353 ub^{-1}	1151	32.6 mb	18.2 nb^{-1}	125	9.2+-0.9 nb
164392	804	268	268	0.000399 ub^{-1}	13	32.6 mb	0.0 nb^{-1}	0	0.0+-0.0 nb
164393	28067	14135	12935	0.0137 ub^{-1}	483	35.3 mb	6.9 nb^{-1}	66	11.7+-1.5 nb
164395	10309	5279	5279	0.00509 ub^{-1}	191	37.6 mb	2.8 nb^{-1}	27	11.1+-2.3 nb
164401	217664	109122	107073	0.107 ub^{-1}	4022	37.6 mb	57.7 nb^{-1}	387	7.7+-0.4 nb
164405	1984	1044	1044	0.00143 ub^{-1}	58	40.5 mb	0.5 nb^{-1}	5	10.8+-5.0 nb
164406	456845	262659	257582	0.401 ub^{-1}	15201	37.9 mb	90.9 nb^{-1}	659	8.3+-0.3 nb
164407	170437	90447	90446	0.209 ub^{-1}	7969	38.2 mb	24.0 nb^{-1}	158	7.5+-0.6 nb
164537	145700	64491	60622	0.0656 ub^{-1}	1458	22.2 mb	81.6 nb^{-1}	349	8.3+-0.5 nb
164539	21501	9749	8542	0.0103 ub^{-1}	250	24.3 mb	9.1 nb^{-1}	49	9.6+-1.5 nb
164541	54879	29483	29414	0.023 ub^{-1}	836	36.3 mb	19.0 nb^{-1}	120	7.5+-0.7 nb
164542	54028	28678	28630	0.0239 ub^{-1}	813	34.1 mb	19.7 nb^{-1}	116	7.5+-0.7 nb
164603	107	39	0	0 ub^{-1}	0	0.0 mb	0.0 nb^{-1}	0	0.0+-0.0 nb
164605	438428	175598	165486	0.139 ub^{-1}	4185	30.1 mb	216.3 nb^{-1}	1301	8.7+-0.3 nb
164607	151483	67106	63576	0.0574 ub^{-1}	1848	32.2 mb	60.0 nb^{-1}	394	8.8+-0.5 nb
164612	216965	96026	90233	0.0837 ub^{-1}	2786	33.3 mb	86.6 nb^{-1}	547	8.2+-0.4 nb
164623	27492	13793	13515	0.0117 ub^{-1}	425	36.3 mb	9.5 nb^{-1}	75	9.4+-1.2 nb
164636	133479	67148	65313	0.0578 ub^{-1}	2134	36.9 mb	47.0 nb^{-1}	304	7.6+-0.5 nb
164637	252466	121812	118772	0.127 ub^{-1}	4799	37.8 mb	68.1 nb^{-1}	455	7.7+-0.4 nb
164999	398117	216009	0	0 ub^{-1}	0	0.0 mb	0.0 nb^{-1}	0	0.0+-0.0 nb
165001	16346	13066	0	0 ub^{-1}	0	0.0 mb	0.0 nb^{-1}	0	0.0+-0.0 nb
165008	123361	68551	0	0 ub^{-1}	0	0.0 mb	0.0 nb^{-1}	0	0.0+-0.0 nb
165053	41	19	0	0 ub^{-1}	0	0.0 mb	0.0 nb^{-1}	0	0.0+-0.0 nb
165055	15860	10643	0	0 ub^{-1}	0	0.0 mb	0.0 nb^{-1}	0	0.0+-0.0 nb
165057	5486	2329	0	0 ub^{-1}	0	0.0 mb	0.0 nb^{-1}	0	0.0+-0.0 nb
165059	77	22	0	0 ub^{-1}	0	0.0 mb	0.0 nb^{-1}	0	0.0+-0.0 nb
	3735235	**1861276**	**1492009**	**1.66 ub^{-1}**	**58164**	**35.0 mb**	**1073.7 nb^{-1}**	**6927**	**8.5 nb**

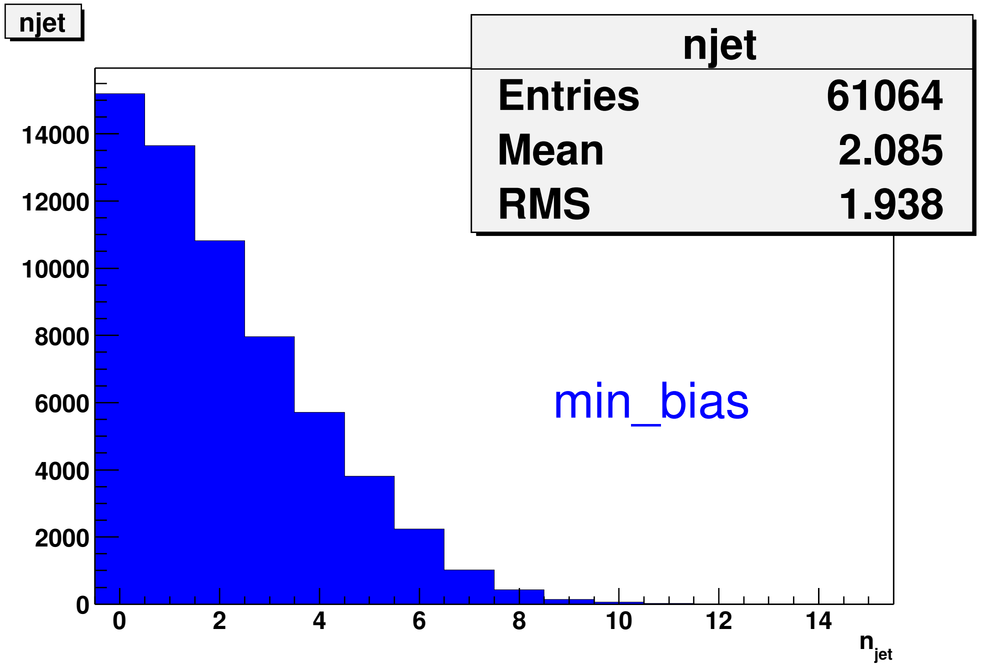
Summary on trigger version 8.20 and 8.30

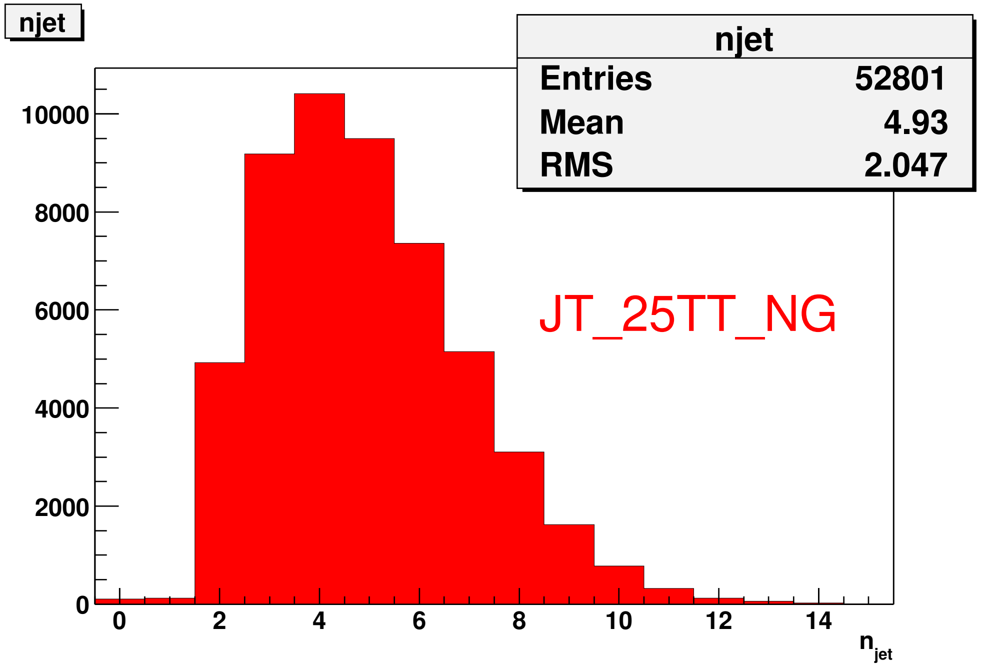
- so far stored 39 million events (29M in 8.20 and 9.6M in 8.30)
- 17 million events ended up in root-tuples (11M + 5.8M)
- 15 million events in our stripped files (11M + 3.7M)
- 91% of events are in good LBNs, $\mathcal{L} = 4.4\,\mathrm{pb}^{-1}$
- one half of the events (7.4M) is kept in the stripped files
  - about $70\,$k events for `JT_25TT_NG` trigger
  - about $300\,$k events for `JT_65TT` trigger
  - about $300\,$k events for `JT_95TT` trigger
  - roughly about $300\,$k events for `min_bias` trigger
- total size $52\,$GB, event size $7.2\,$kB
- typical time scale of the analysis is several hours
- stripping takes time, about 1 million events per day
  - so far it was enough but may/hope not be in the near future
  - there is a plenty of room how to improve it

stripping - possible scenarios

- near term plan - data for Moriond 2003
- we can expect to work with 10 times more data, $\mathcal{L} \sim 50\,\mathrm{pb}^{-1}$
- if we continue with what we are doing now
  - 170 million events
  - 80 million events in stripped files, 550 GB of the data
- if we concentrate only on jet + minimum bias triggers
  - 10-15 million events, about 100 GB of root tuples
  - still, we will not be able to put back the CAL block probably
- from the long term point of view
  - root tuples produced by reco_analyze will disappear
  - we should switch to DST/thumbnails as soon as possible
  - we should revised out stripping strategy (DST/TMB, what triggers)
  - we should put back the stripped files on SAM

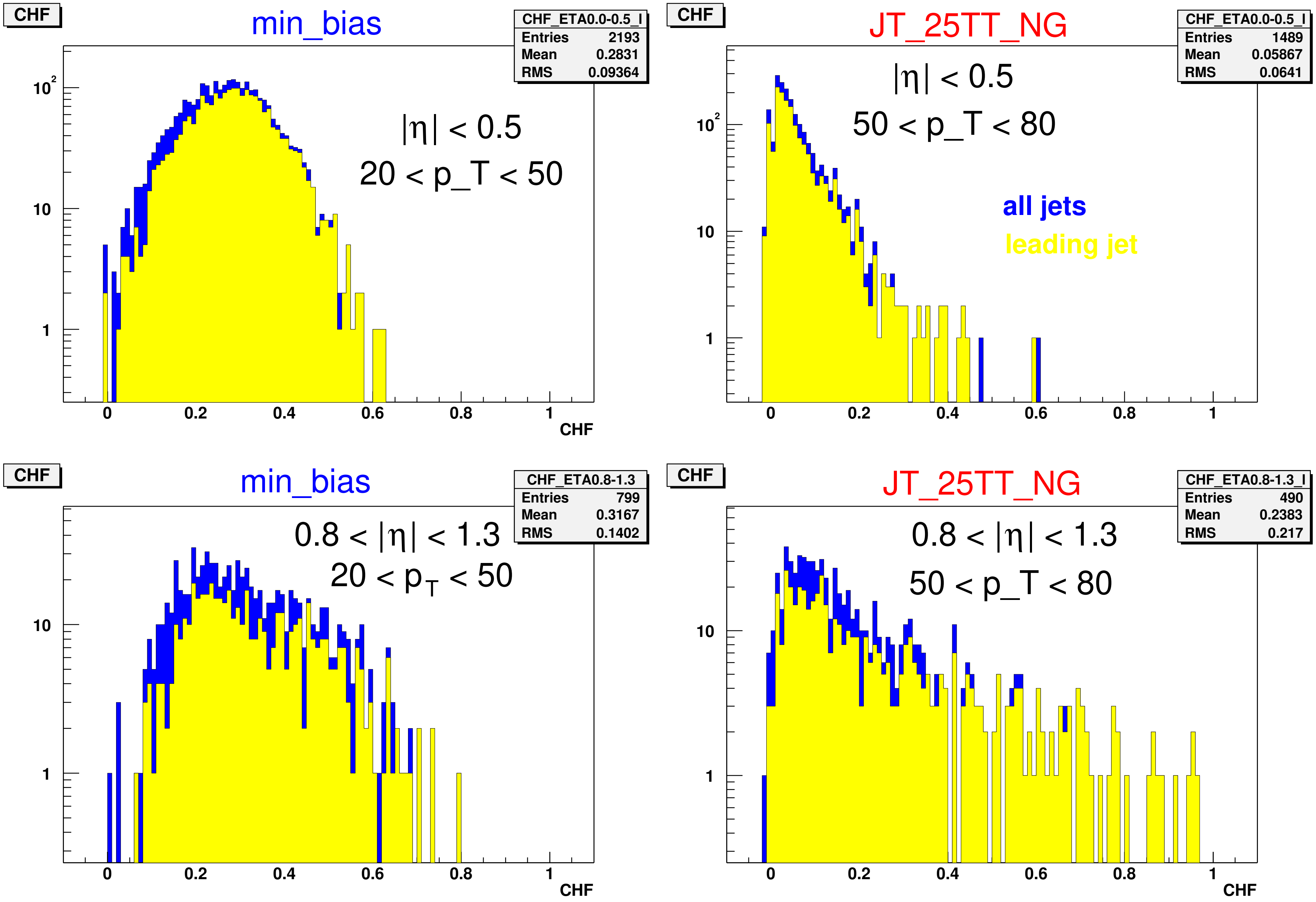
number of jets per event





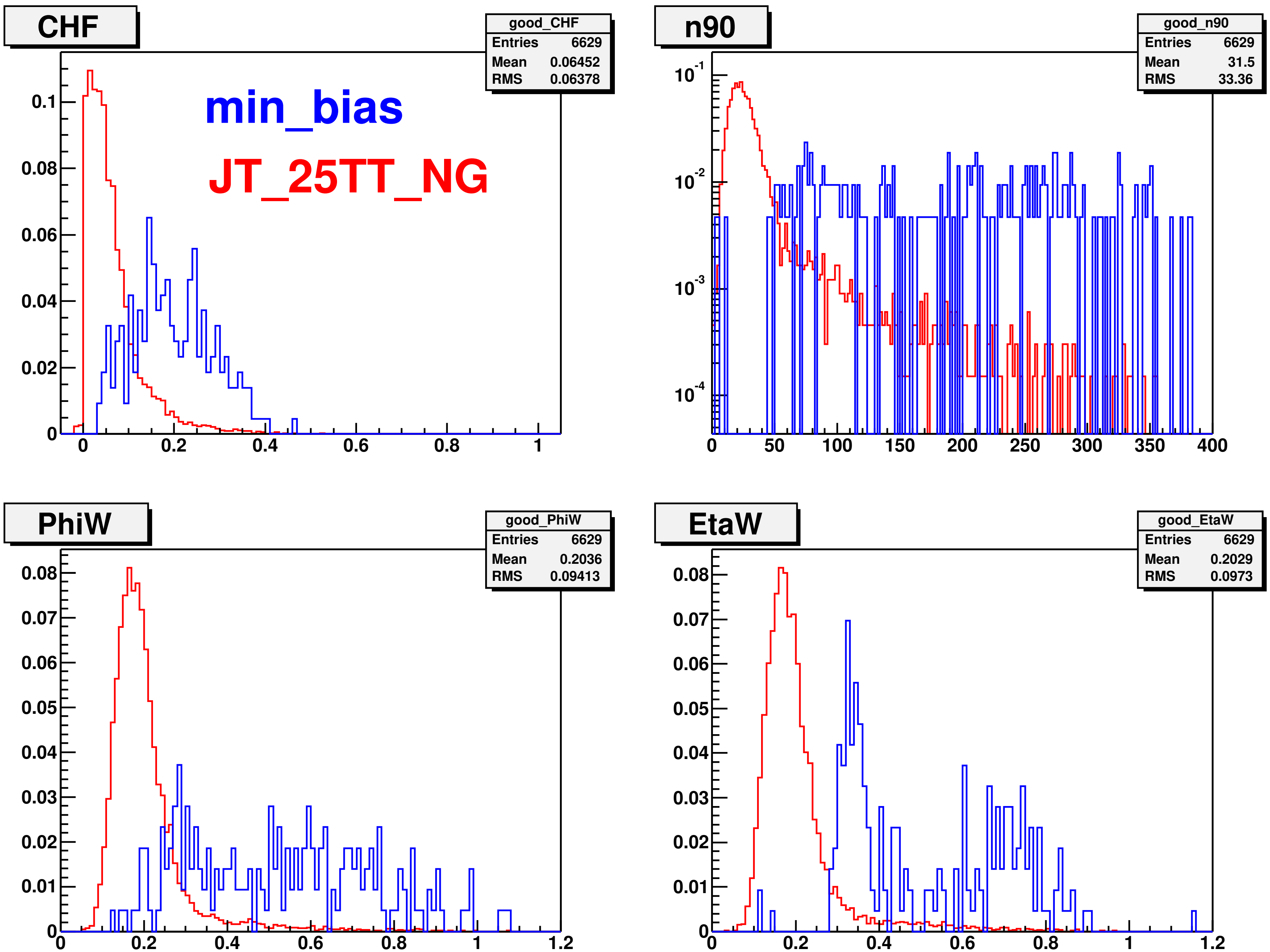
- much better than in trigger version 7.40 data
- still not ideal
- what are those events with no jet in case of JT_25TT_NG trigger?

CHF

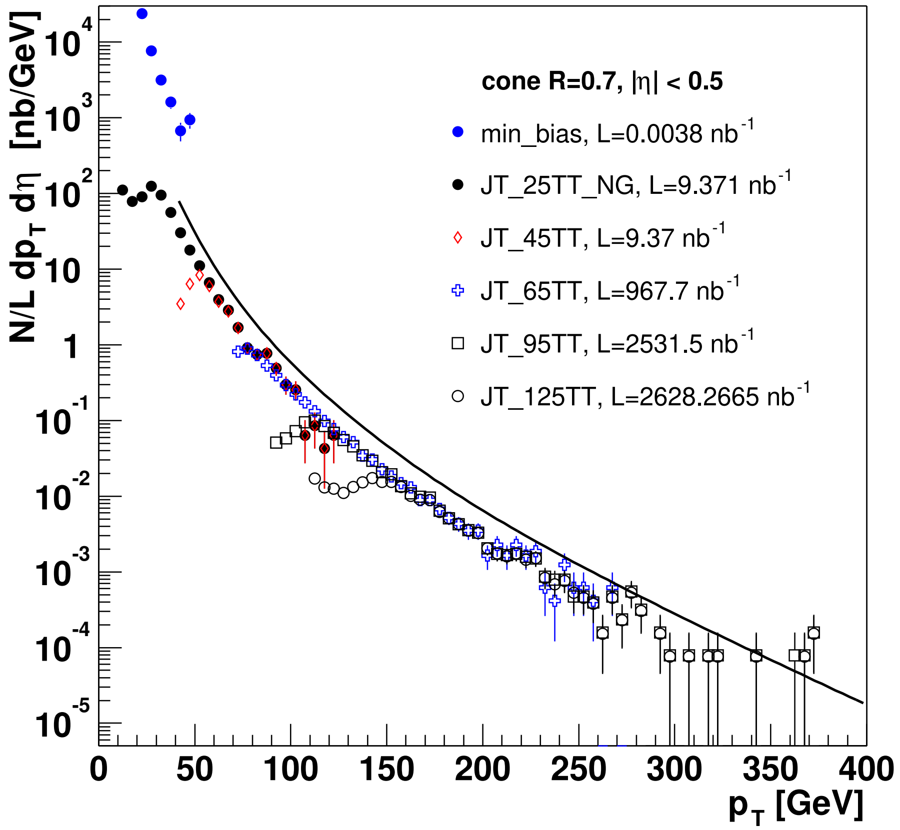


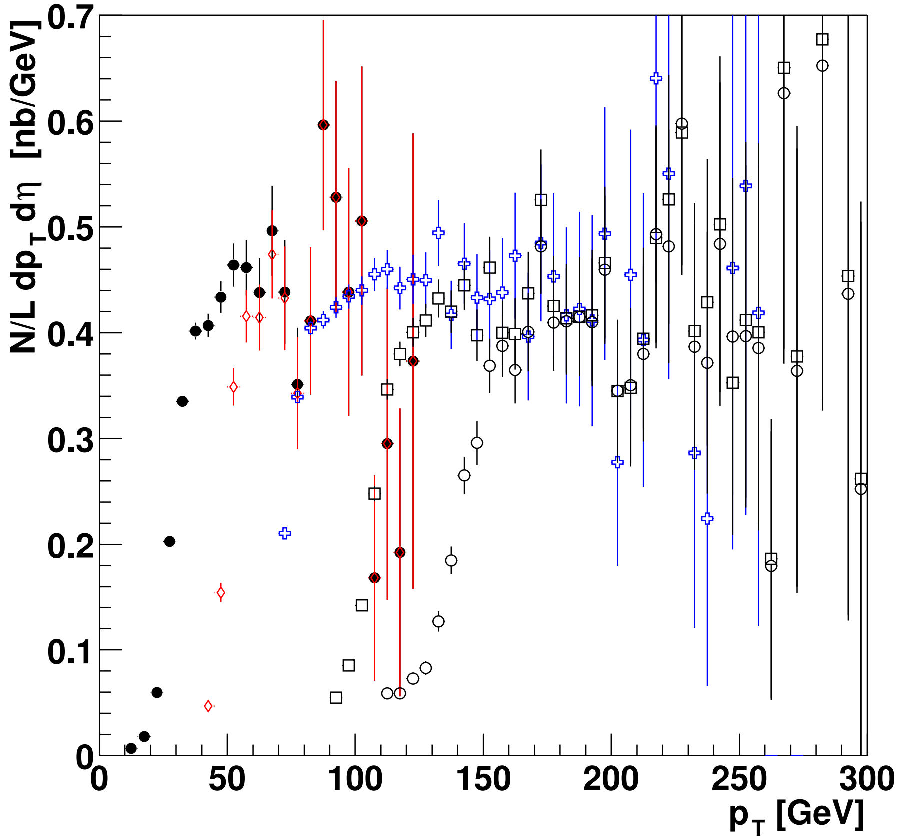
CHF
min_bias
CHF_ETA0.0-0.5_l
Entries 2193
Mean 0.2831
RMS 0.09364
|η| < 0.5
20 < p_T < 50
CHF
JT_25TT_NG
CHF_ETA0.0-0.5_l
Entries 1489
Mean 0.05867
RMS 0.0641
|η| < 0.5
50 < p_T < 80
all jets
leading jet
CHF
min_bias
CHF_ETA0.8-1.3
Entries 799
Mean 0.3167
RMS 0.1402
0.8 < |η| < 1.3
20 < p_T < 50
CHF
JT_25TT_NG
CHF_ETA0.8-1.3_l
Entries 490
Mean 0.2383
RMS 0.217
0.8 < |η| < 1.3
50 < p_T < 80

jet width, $|\eta| < 0.5$, $35\,\mathrm{GeV} < p_T < 60\,\mathrm{GeV}$



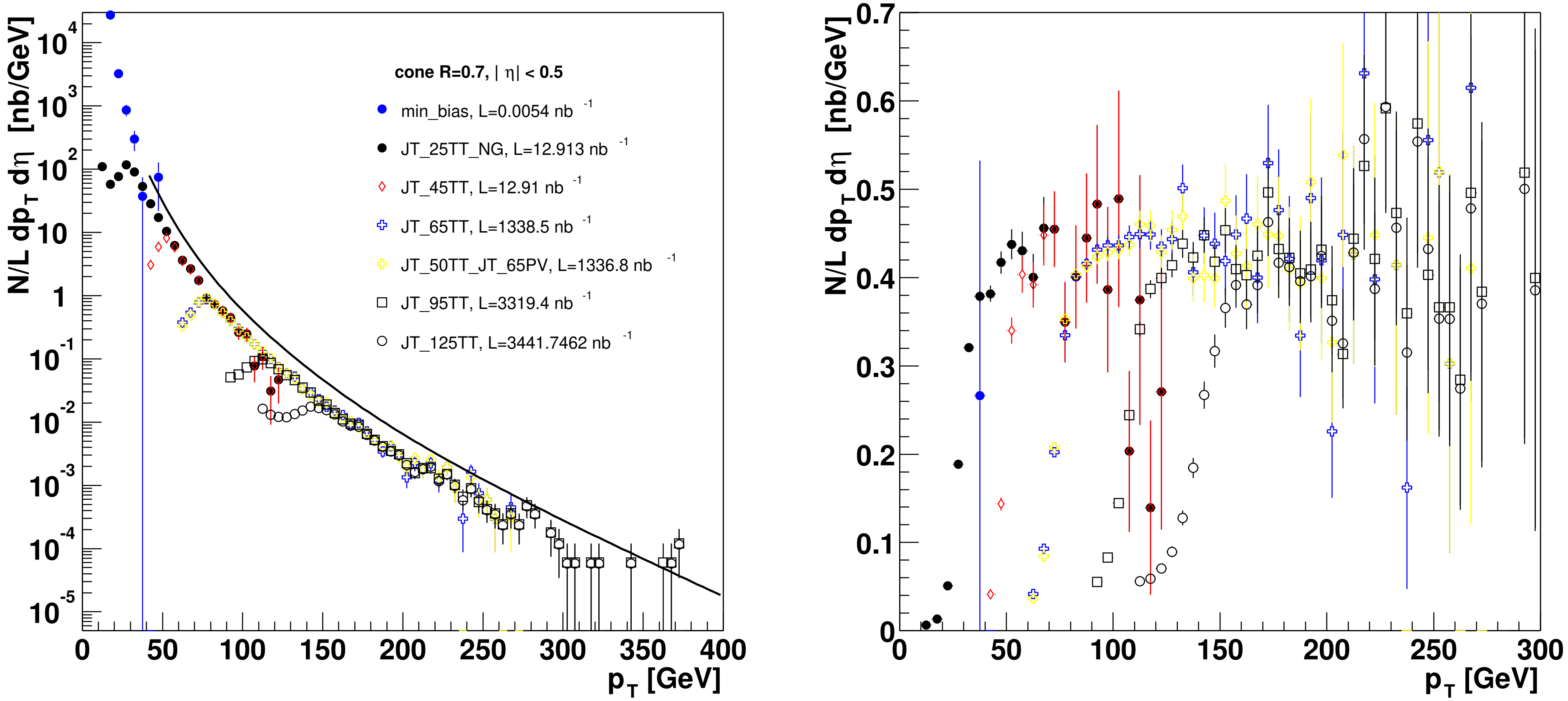
jet inclusive p_T spectrum





- L1 trigger for JT_25TT_NG is now CJT(2,5) (was 2,3)
- trigger JT_45TT is not useful any more
  - the same L1 trigger as for JT_25TT_NG, with the same prescale
- trigger JT_45TT_L2 also based on CJT(2,5) but even more prescaled
- we need something between JT_25TT_NG and JT_65TT

jet inclusive p_T spectrum with $n90 < 50$ cut



- ∘ minimum bias starts to match the jet low p_T trigger
- ∘ otherwise almost no effect on p_T spectrum
- ∘ $n90 < 50$ cut is very dangerous
  - we could eliminate real (merged) jets and biased our jets

needs

- decide what files we are going to use (root/TMB/DST)
- run selection
- revise jet ID cuts - coordination with Jet/MET ID group
- trigger efficiencies (at least the turn-on points)
- event and jet selection efficiencies
- jet energy scale
- jet energy resolution
- for dijet mass analysis we need also ϕ and η resolutions
  - reliable monte carlo
- if we want to have a comparison with NLO theory
  - tune the R_{sep} parameter
  - study the jet shapes