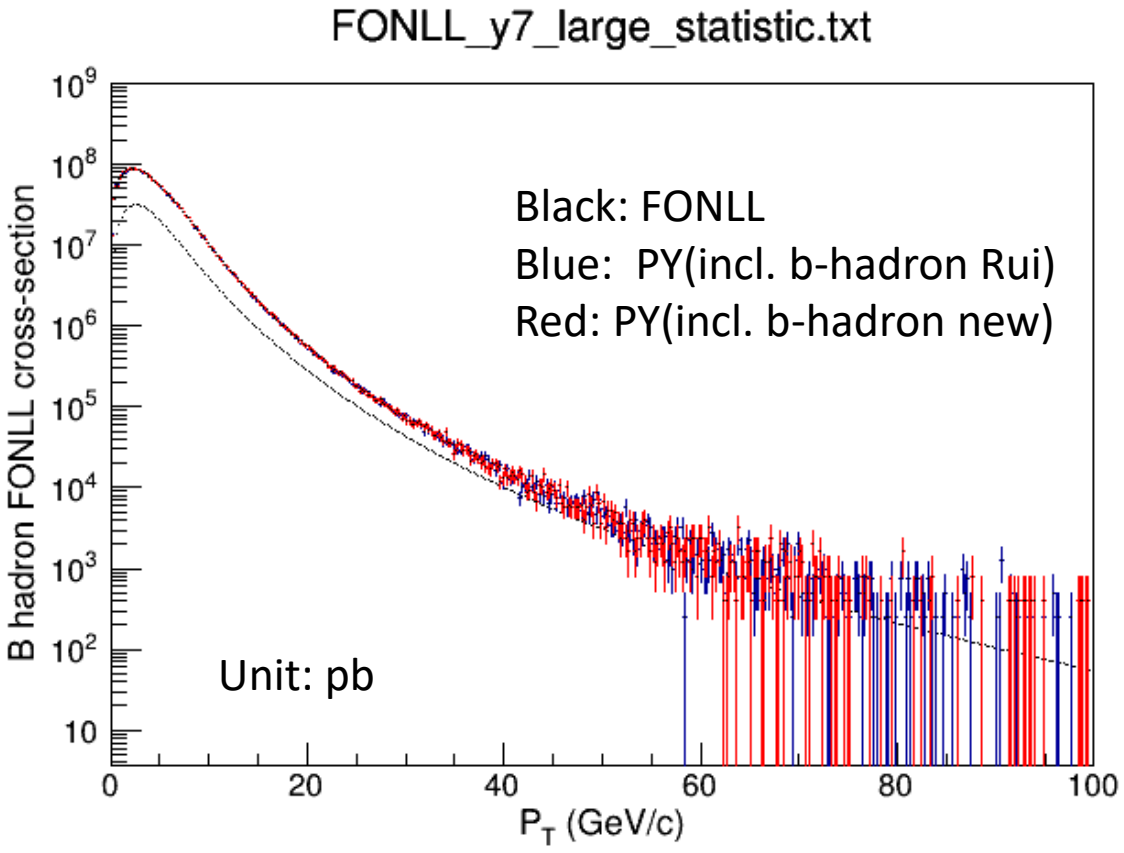
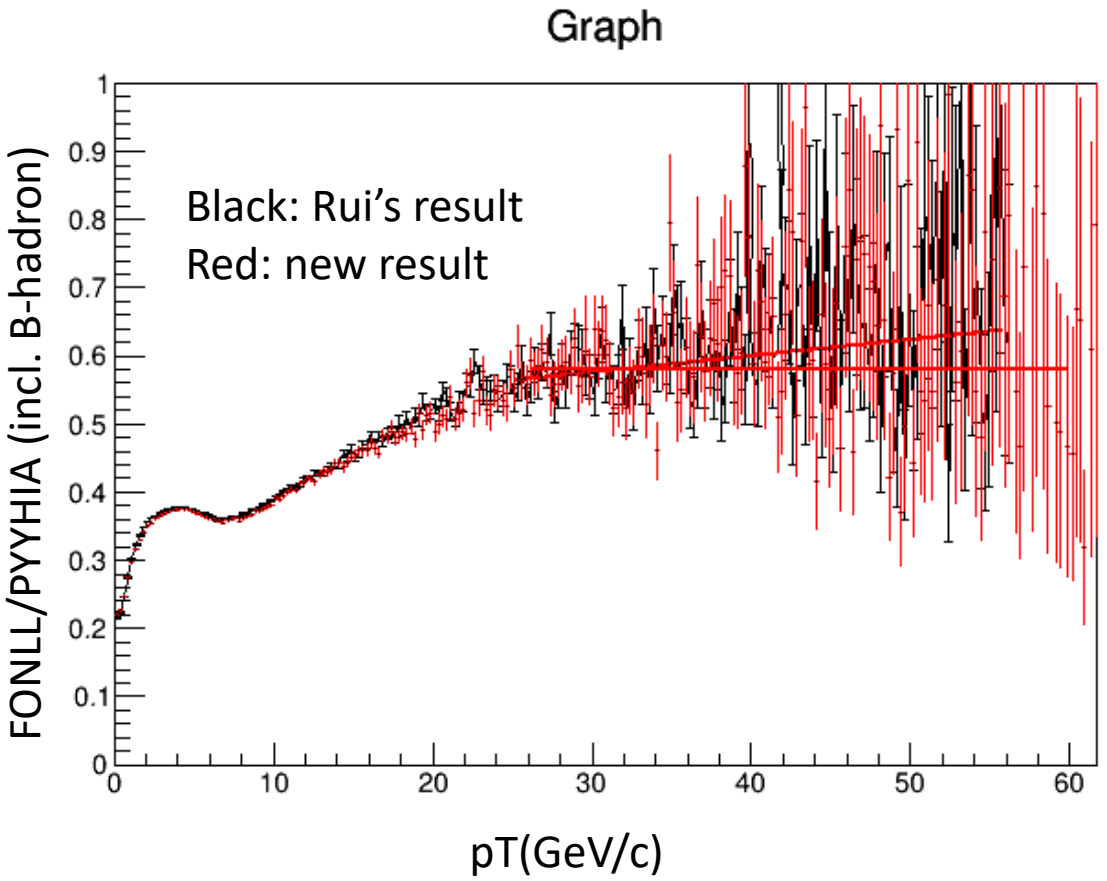
Inclusive B-hadron and Weight comparison with Rui's results

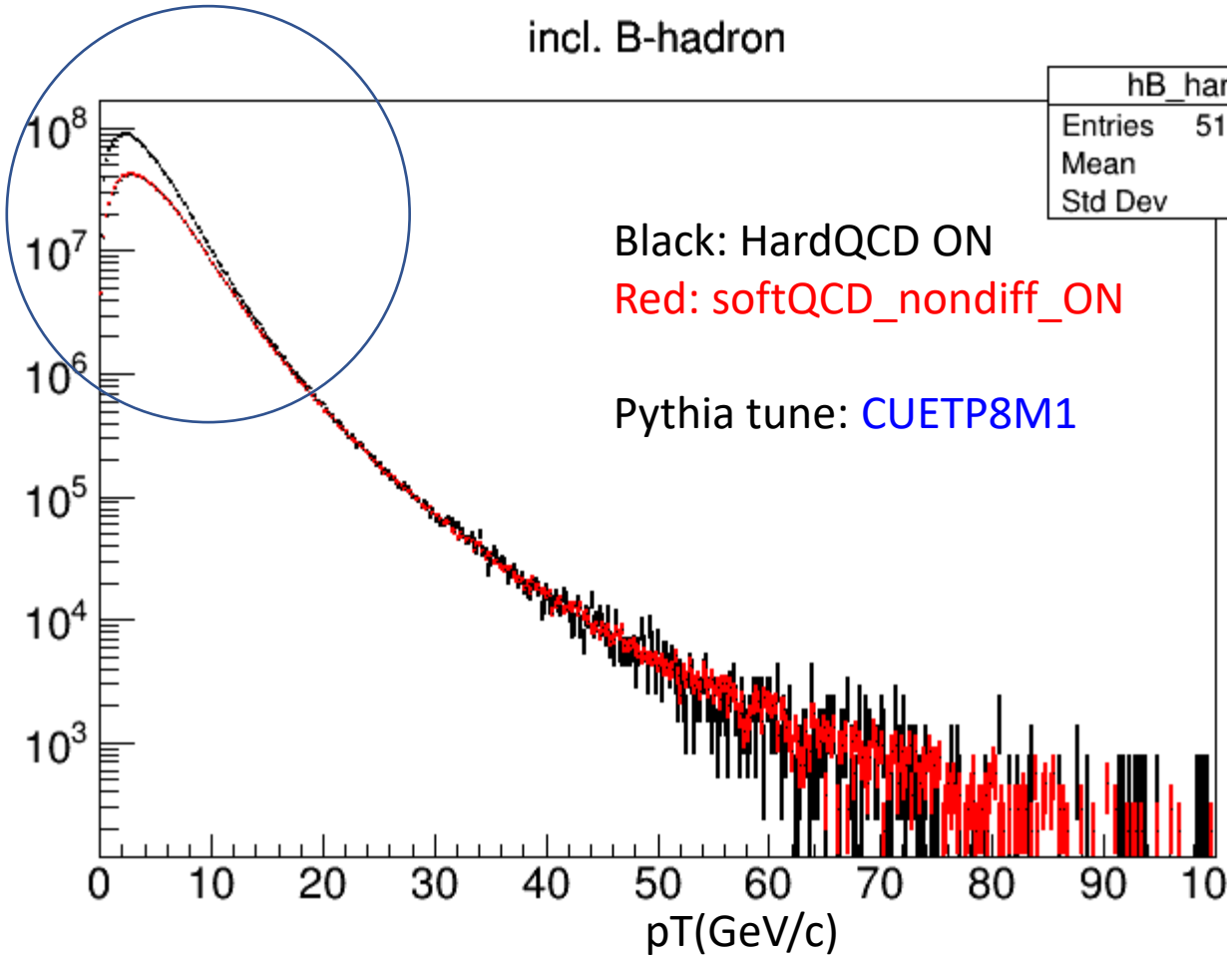


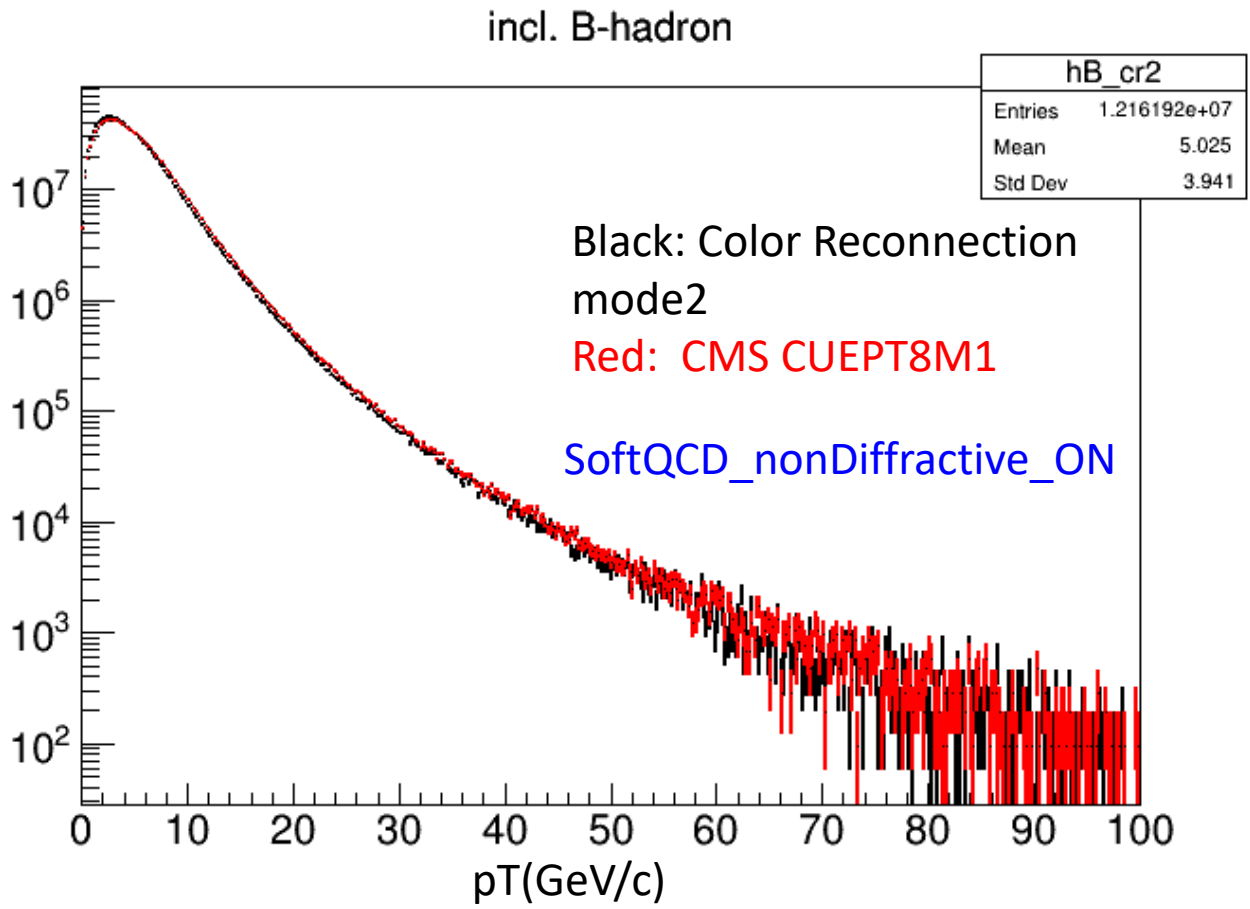


- pythia8302:
  - Pythia8 tune: CUETP8M1
  - HardQCD_ON
  - decay with EvtGen

- reproduce Rui's weight result
- Mistake in last presentation:
  - Did not remove B-hadrons decaying into B-hadrons.

Hard_QCD_ON ----- soft_nondiff_ON ----- PYTHIA tunes

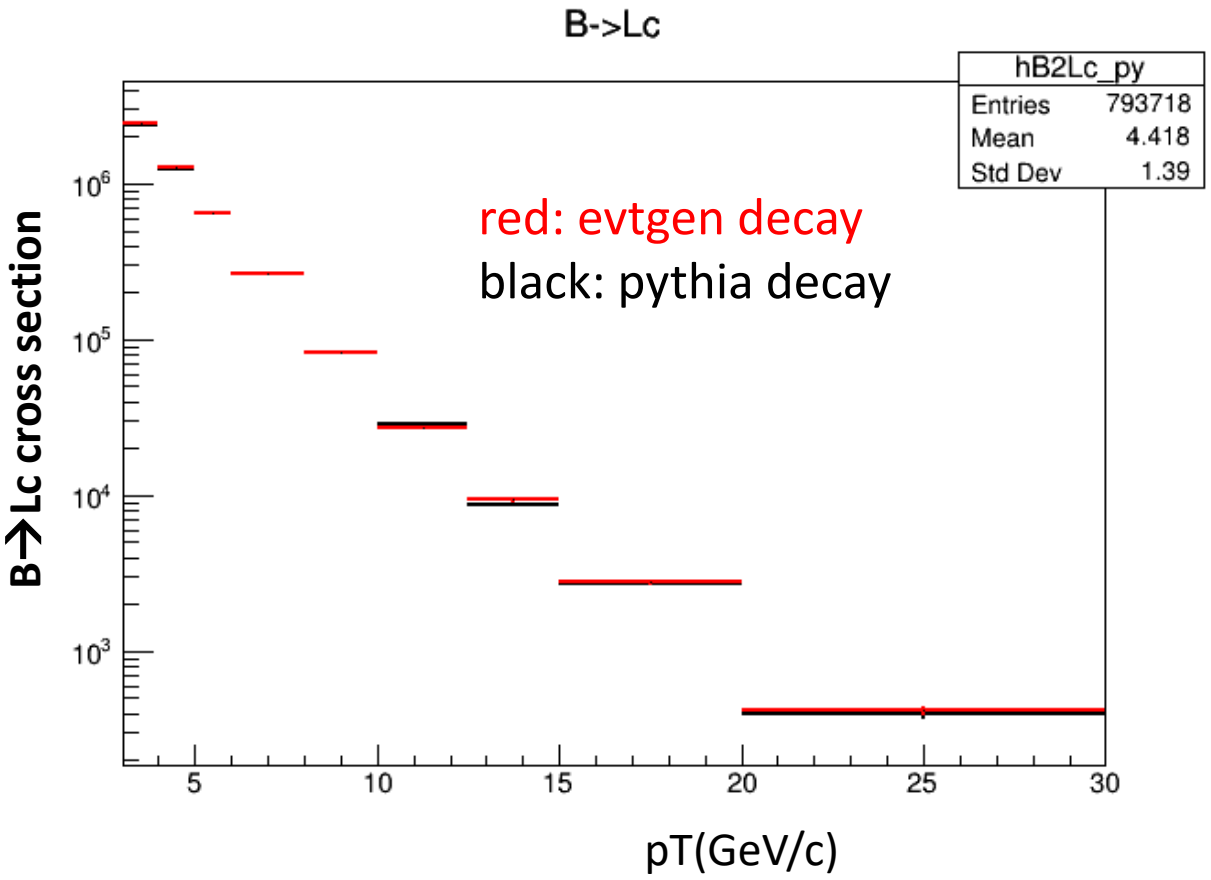


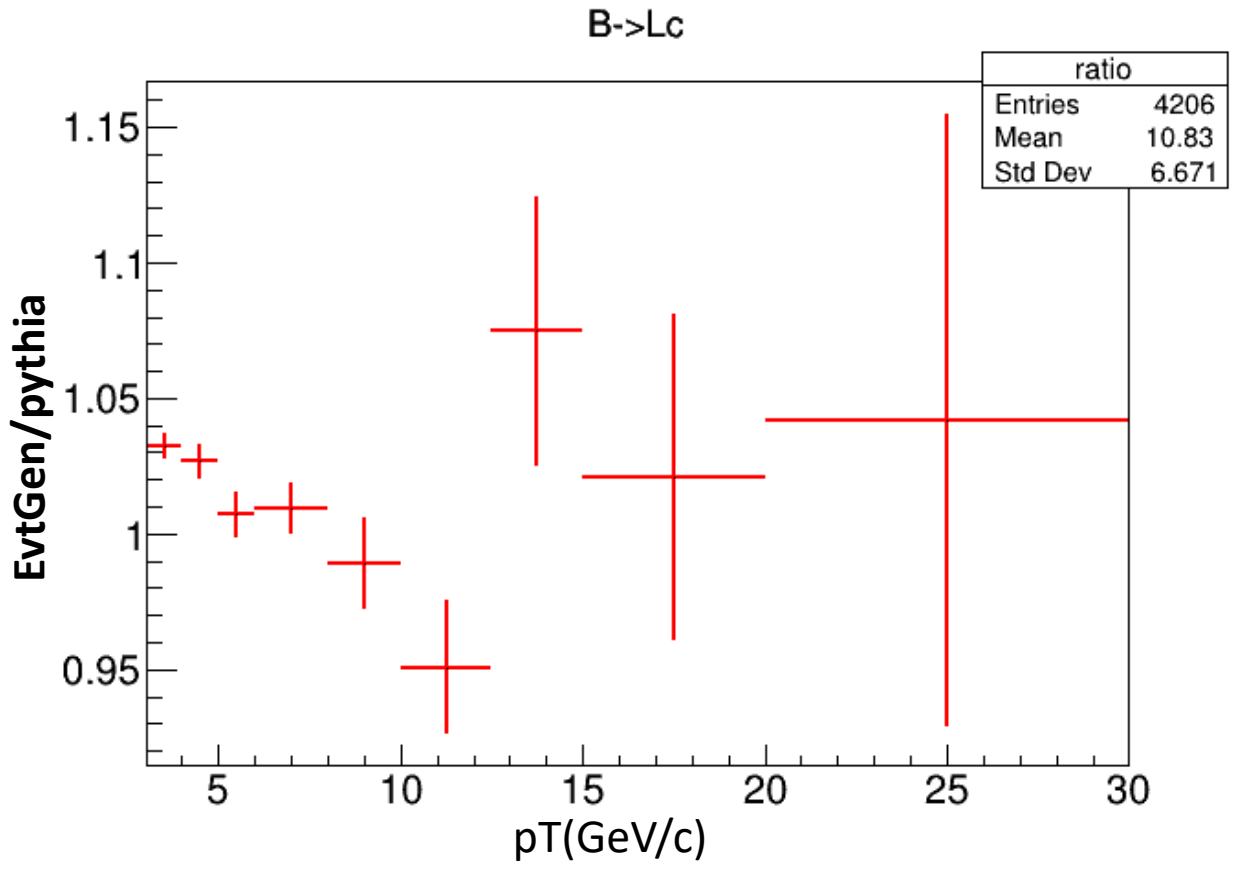


- pT>15 GeV/c, no difference between
  - SoftQCD_nonDiffractive_ON and
  - HardQCD_ON
- pT<15 GeV/c need to use SoftQCD_nonDiffractive_ON
  - Communication with pythia author

Small difference between
- CMS CUEPT8M1 and
- Color Reconnection mode2

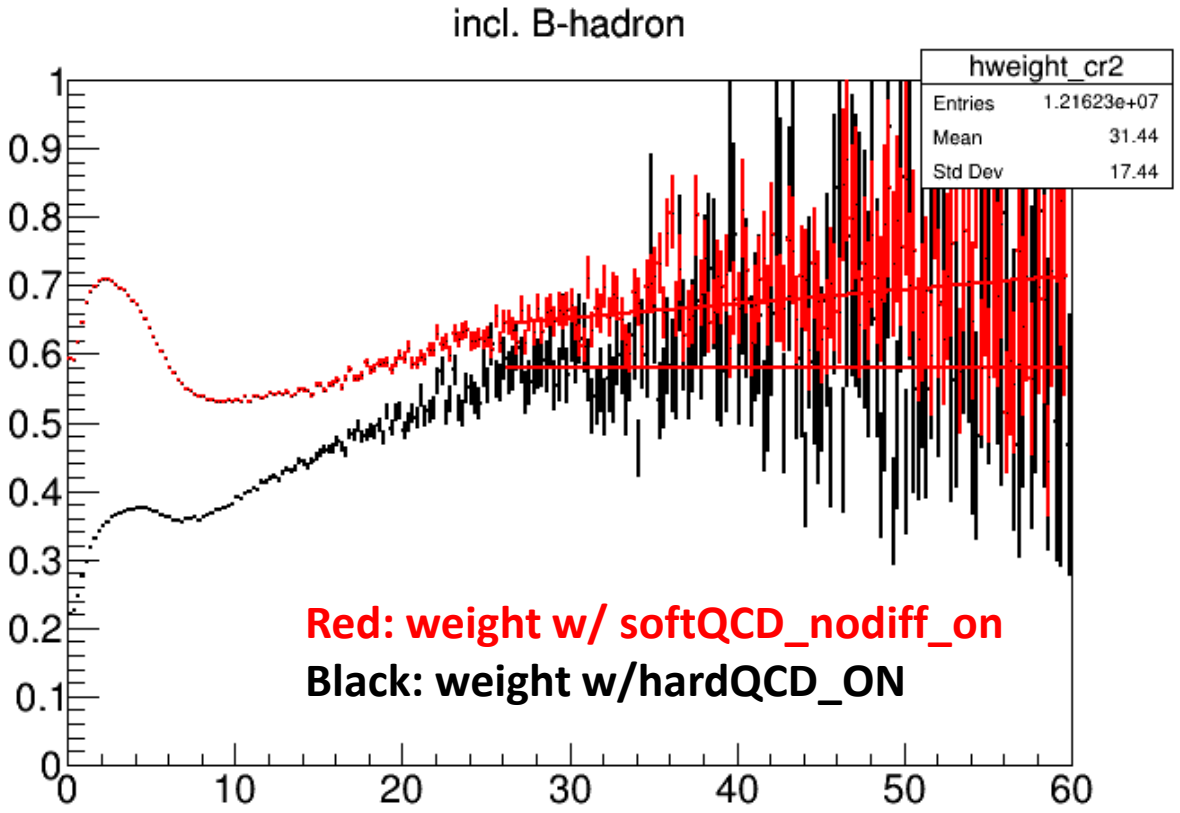
B→Lc With and Without Using EvtGen

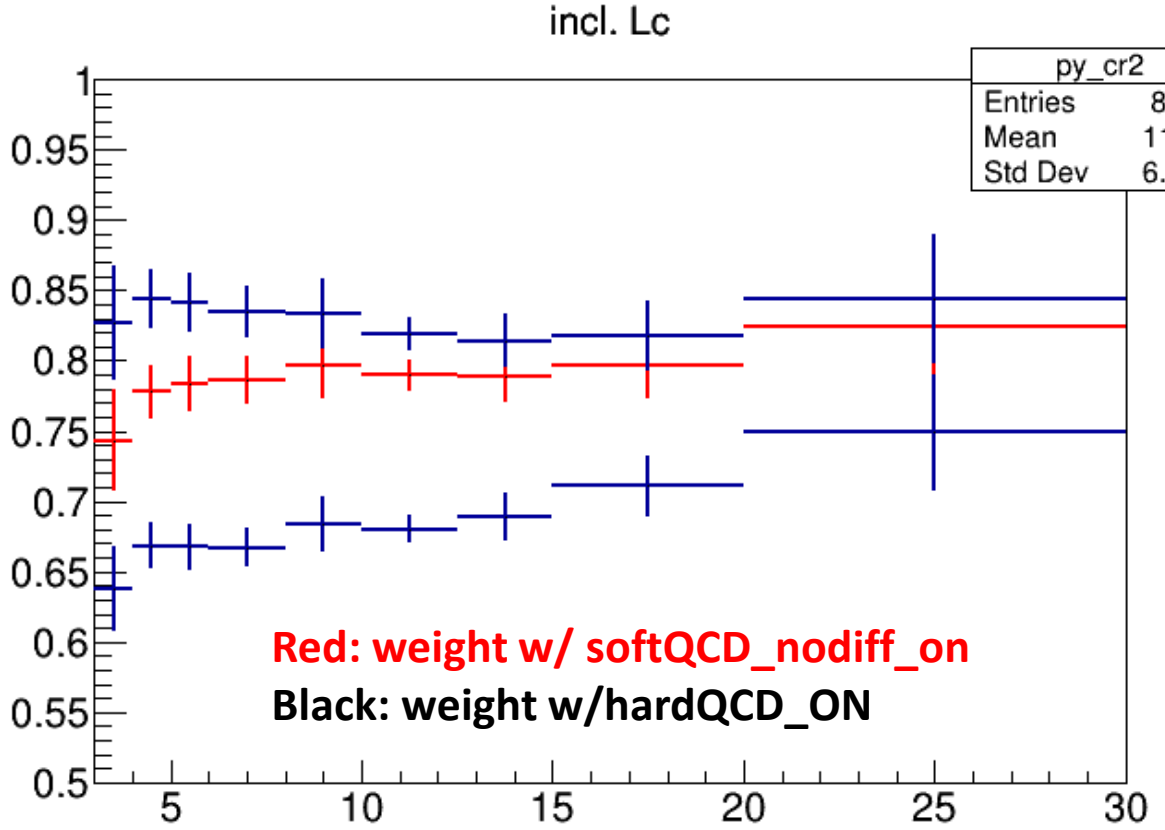




- Effect of decay kinematic ~ 5%.
- Final result use EvtGen

Lc prompt ratio with old and new weight



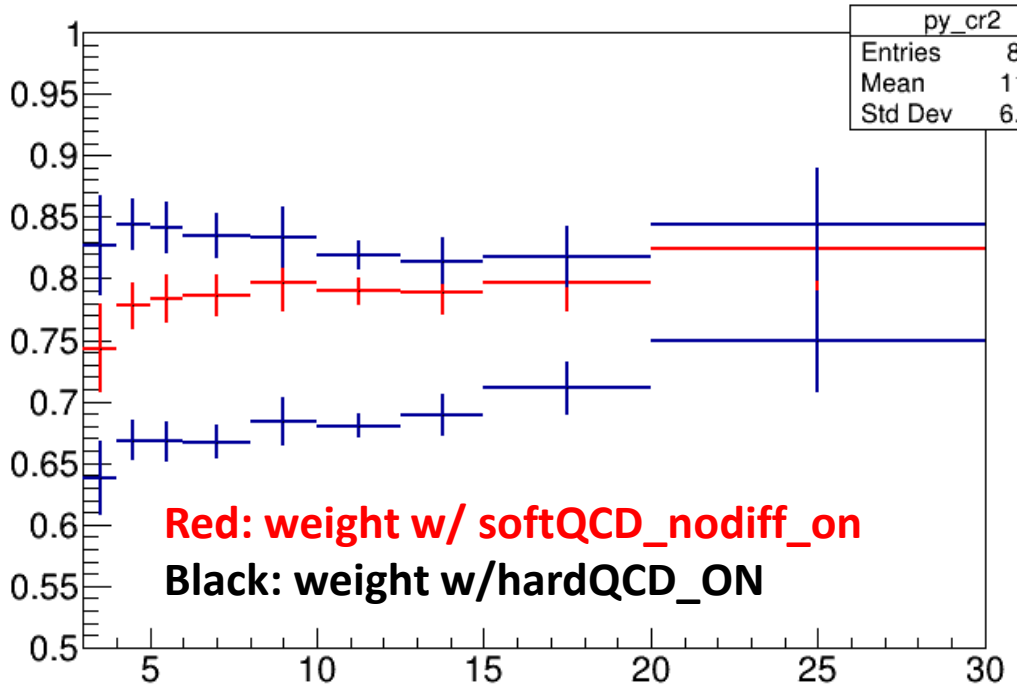


- Inclusive Lc is from CR2 tune with softQCD_nondiff_ON
  - It describe the data
- In the last presentation, FONLL cross section for B→Lc missed the 2*lum (0.04 pb^-1) and bin width normalization
  - Rui probably made the same mistake leading to high prompt ratio in FONLL

Final results of Lc prompt ratio from PYTHIA

p_T intervals (GeV/c)	fitted prompt ratio	PYTHIA	FNOLL	uncertainty (%)
3-4	0.85	0.67	0.98	21.2
4-5	0.85	0.70	not needed	16.5
5-6	0.8	0.70	not needed	11.3
6-8	0.88	0.68	not needed	6.8
8-10	0.73	0.67	not needed	9.6
10-12.5	0.78	0.66	not needed	20.5
12.5-15	0.89	0.66	not needed	11.1
15-20	0.89	0.68	0.90	23.6
20-30	0.89	0.70	0.91	21.3

Table 3: This table shows all the fitted prompt ratio got from the best MC resolution scale factor, th incl. Lc n PYTHIA8 an



Using weight from softQCD_nondiff_ON.

pT	PYTHIA	FONLL
3-4	0.64	0.74
4-5	0.67	0.78
5-6	0.67	0.78
6-8	0.67	0.79
8-10	0.68	0.80
10-12.5	0.68	0.79
12.5-15	0.69	0.79
15-20	0.71	0.80
20-30	0.75	0.82

backup

```
 pythia.readString("SoftQCD:nonDiffractive = on");
// Color reconnection tune (CR) mode2
  pythia.readString("Tune:pp 14");
  pythia.readString("Tune:ee 7");
  pythia.readString("MultipartonInteractions:ecmPow=0.215");
  pythia.readString("MultipartonInteractions:expPow=1.85");
  pythia.readString("StringPT:sigma =0.335");
  pythia.readString("StringZ:aLund =0.36");
  pythia.readString("StringZ:bLund =0.56");
  pythia.readString("StringFlav:probQQtoQ =0.078");
  pythia.readString("StringFlav:ProbStoUD =0.2");
  pythia.readString("StringFlav:probQQ1toQQ0join =
0.0275,0.0275,0.0275,0.0275");
  pythia.readString("MultiPartonInteractions:pT0Ref =2.15");
  pythia.readString("BeamRemnants:remnantMode =1");
  pythia.readString("BeamRemnants:saturation= 5");
  pythia.readString("ColourReconnection:mode = 1");
  pythia.readString("ColourReconnection:allowDoubleJunRem =off");
  pythia.readString("ColourReconnection:m0=0.3");
  pythia.readString("ColourReconnection:allowJunctions =on");
  pythia.readString("ColourReconnection:junctionCorrection=1.2");
  pythia.readString("ColourReconnection:timeDilationMode=2");
  pythia.readString("ColourReconnection:timeDilationPar=0.18");
```

- Rui's pythia root file is no available anymore;
- We need to redo the pythia simulation to estimate the prompt ratio.

- all codes are at:
- https://github.com/wxie2013/LambdaC-PYTHIA8-simulation.git

- PYTHIA8302.