

# Inclusive jet measurement

## Unfolding with MC samples

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# Introduction.

Strategy

## Reminder

- Inclusive jet measurement is aiming at ultimate precision in order to deliver best possible QCD fits.
- For this reason, we first tried unfolding based on a toy approach.
- However, attempts to reproduce effects of the detectors, although pretty sophisticated, still require some work that we may not have the time to dedicate to this analysis.
- For the time being, and probably for this analysis, we decided to return to unfolding with MC samples.

## Goal of this presentation

- BLT
- CT
- matrix condition
- backfolding
- systematics
- correlations



# Introduction II

## Remark

- This presentation is an updated version of the slides I presented last week at the SMP-HAD meeting.
- However it includes now also AK7 data, as well as minor additions.





# Introduction

## Strategy

### Dimension

- At the end of the day, we want 2D unfolding with proper handling of all correlations & migrations.
- The good news is that in principle, it is easy: the `TUnfoldBinning` class maps ND unfolding to 1D unfolding; then the `TUnfold` can be used in the identical way.
- We try 1D (2D) unfolding without (with) `TUnfoldBinning`, just to cross-check in case of mistake with this additional layer of difficulties.

### Instabilities at the edges of the phase space

- Disentangle different sources of miss and fake entries.
- Include uncertainties for miss & fake in covariance matrix used in the unfolding.
- Unfold in slightly larger phase space.

### Regularisation

- Given the condition value ( $< 10$ ), we do not consider (at the moment) any Tikhonov regularisation.
- We may give it a try later.

# Building blocks.

Miss & fake

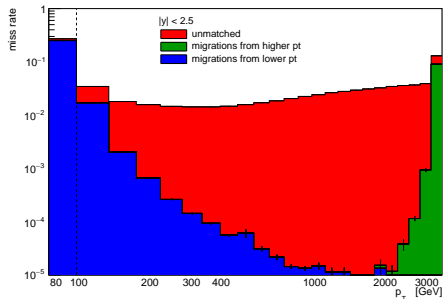
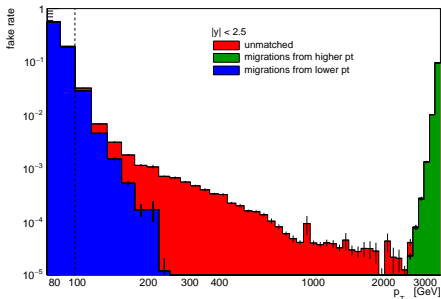
Probability matrix

Purity & Stability



# Building blocks

## Miss & fake



## Figures (here showing the 1D case)

Disentangling three sources of inefficiencies (miss) and background (fake)

- Migrations in- and outside of the phase space, separately for low and high  $p_T$ .
- Real background, corresponding to unmatched jets (should it be decorrelated between forward and barrel regions?)

→ This seems to solve the instabilities at the edges of the phase space (see later).

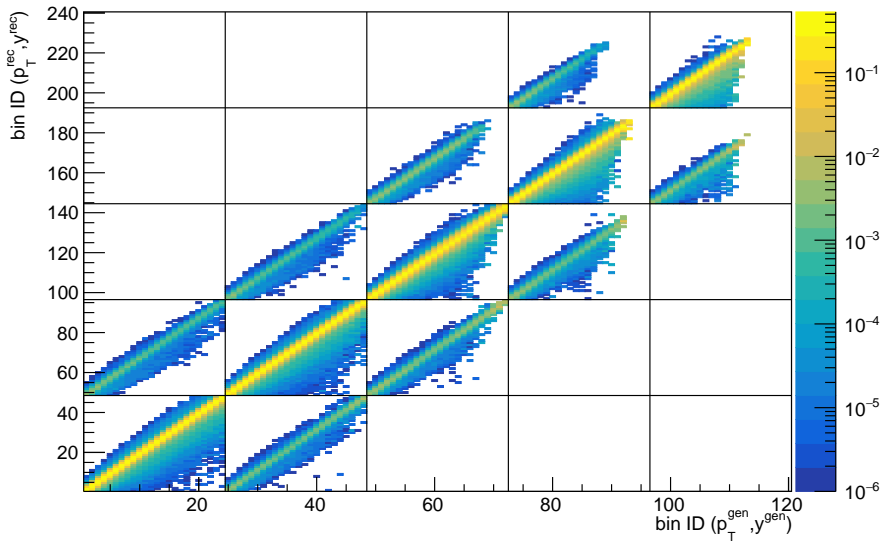
**PS:** TUnfoldBinning also offers tools to handle migrations in- and outside of the phase space, but so far, I am treating them *by hand*.

## Condition

AK4: 4.42 (shown here), AK7: 3.87

## Building blocks

Probability matrix



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Miss &amp; fake

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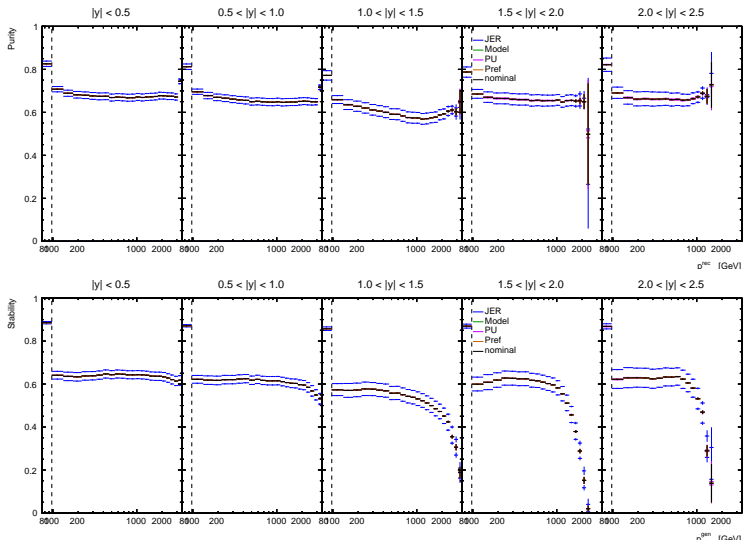
# Building blocks

## Purity & Stability

### RM variations

- Model ( $p_T$ )
- Prefiring correction
- **Resolution smearing**
- Pile-up profile

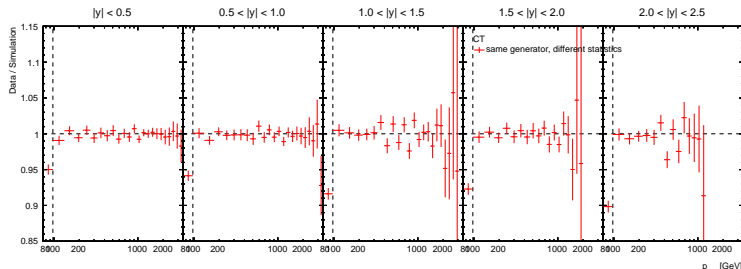
→ only the resolution smearing has a significant impact on the purity and stability...



# Unfolding.

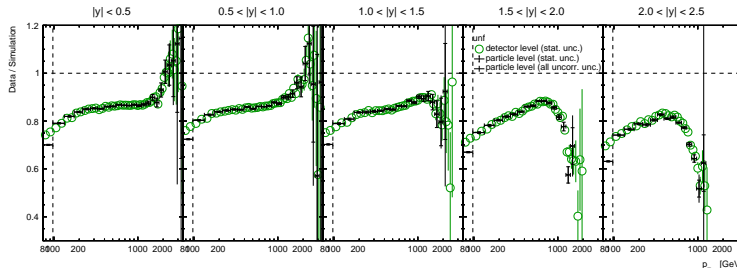
Closure test

Bottom line test



## Levels of closure

- 1 Use the exact same dataset as pseudo-data and as simulation sample to unfold (not shown here).
- 2 **Use the same generator but distinct samples for pseudo-data and simulation samples** (expect ratio compatible with one – seems to be the case).
- 3 Use two different generators (not done, but model uncertainty is considered).



## Figure

- Ratio of data and simulation before (green open circles) and after (black crosses) unfolding.
- Agreement of similar level, meaning that the effect of the detector is removed from the data as exactly described by the Pythia sample (only difference is at  $p_T < 97$  GeV).

## Test

Detector level (after merging bins)  $\chi^2/\text{ndf} = 505506/109 = 4637.67$

Hadron level (with data unc. only)  $\chi^2/\text{ndf} = 597922/110 = 5435.66$

Hadron level (with all uncorr. unc.)  $\chi^2/\text{ndf} = 440600/110 = 4005.45$

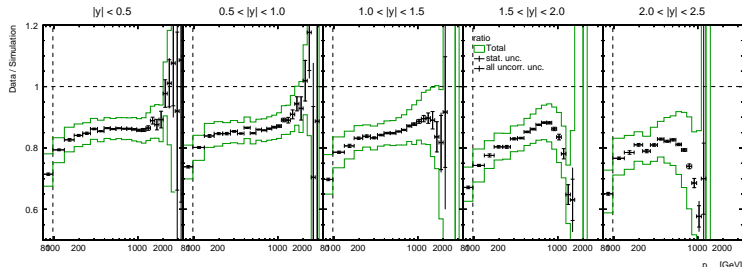
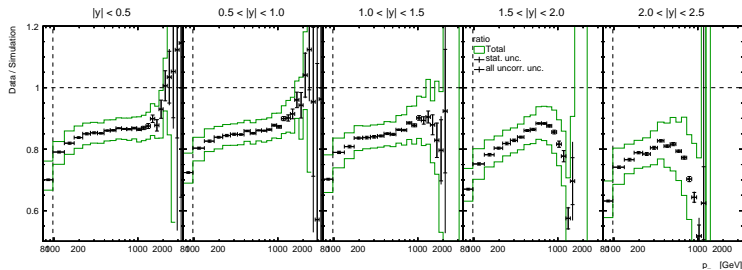
# Result.

Ratio

Uncertainties

Correlations

(ak4 above, ak7 below)



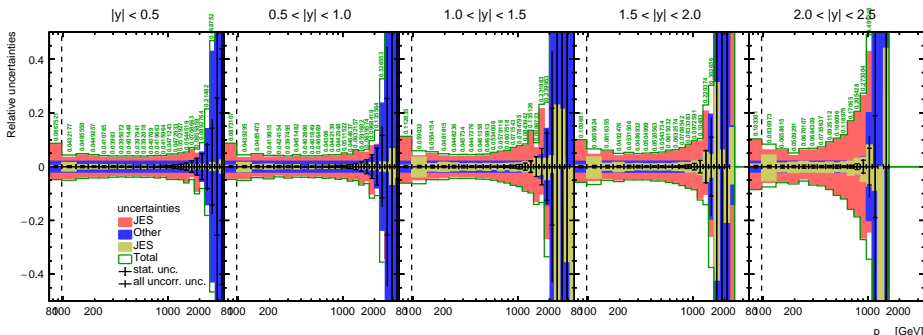


Figure (using same conventions as in ATLAS paper)

- Varying miss & fake rate with 3%, error accounted in covariance matrix used to perform unfolding (high  $p_T$  behaviour to be improved).
- Model uncertainty is included by varying the slope of the Pythia sample (currently only for  $p_T$ , maybe also later for  $y$ ).
- Uncertainties are not smoothed, but picture is similar to result from 1D unfolding (see AN – smoothing is not necessary for QCD fits, so we *might*

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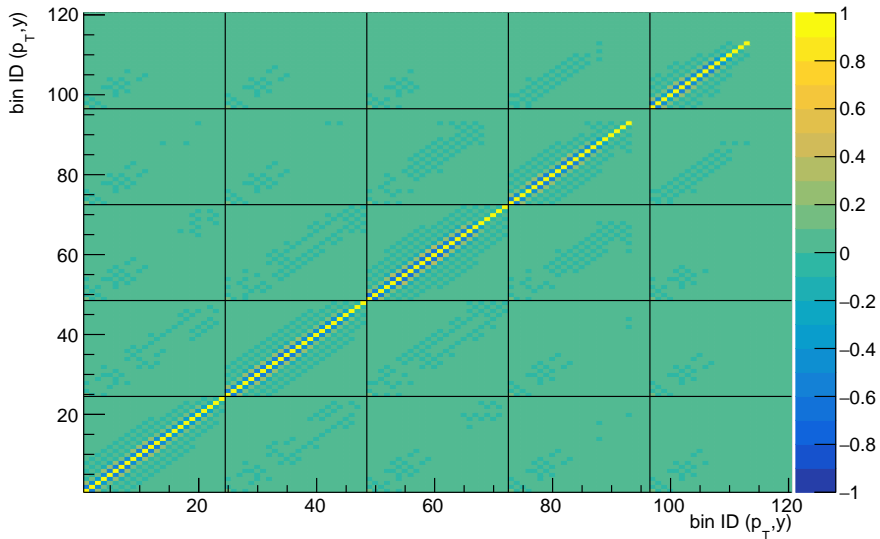
Uncertainties

Correlations

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# Tables.

AK4

AK7

$|y| < 0.5$

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$p_T$ range in GeV	cross section in pb/GeV	tot. stat. unc. [%]	luminosity [%]	JER [%]	Model [%]	PU [%]	Pref [%]	fakeNoMatch [%]	fakeOutHigh [%]
74 – 97	$3.4 \times 10^4$	$\pm 0.37$	$\pm 2.0$	+0.43 +0.17	-0.01 +0.01	-0.03 +0.03	+0.00 -0.00	+0.01 -0.01	+0.00 -0.00
97 – 133	$9.3 \times 10^3$	$\pm 0.37$	$\pm 2.0$	+1.53 -1.62	+0.07 -0.07	+0.03 -0.03	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
133 – 174	$2.2 \times 10^3$	$\pm 0.39$	$\pm 2.0$	+0.72 -0.84	+0.06 -0.06	-0.03 +0.04	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
174 – 220	$6 \times 10^2$	$\pm 0.31$	$\pm 2.0$	+0.81 -0.77	+0.05 -0.05	-0.02 +0.02	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
220 – 272	$1.8 \times 10^2$	$\pm 0.38$	$\pm 2.0$	+0.74 -0.83	+0.04 -0.04	-0.04 +0.04	-0.01 +0.01	+0.00 -0.00	+0.00 -0.00
272 – 330	62	$\pm 0.35$	$\pm 2.0$	+0.69 -0.65	+0.04 -0.04	-0.04 +0.04	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
330 – 395	22	$\pm 0.24$	$\pm 2.0$	+0.60 -0.69	+0.03 -0.03	-0.04 +0.05	-0.01 +0.01	+0.00 -0.00	+0.00 -0.00
395 – 468	8.3	$\pm 0.21$	$\pm 2.0$	+0.59 -0.54	+0.03 -0.03	+0.04 +0.03	-0.01 +0.01	+0.00 -0.00	-0.00 +0.00
468 – 548	3.2	$\pm 0.24$	$\pm 2.0$	+0.42 -0.48	+0.03 -0.03	+0.01 -0.00	+0.01 -0.00	+0.00 +0.00	+0.00 -0.00
548 – 638	1.3	$\pm 0.11$	$\pm 2.0$	+0.57 -0.60	+0.02 -0.02	-0.08 +0.07	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
638 – 737	0.53	$\pm 0.14$	$\pm 2.0$	+0.34 -0.44	+0.02 -0.02	-0.02 +0.02	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
737 – 846	0.22	$\pm 0.19$	$\pm 2.0$	+0.55 -0.47	+0.02 -0.02	-0.05 +0.05	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
846 – 967	0.091	$\pm 0.28$	$\pm 2.0$	+0.39 -0.50	+0.02 -0.02	+0.00 +0.01	-0.00 +0.00	-0.00 -0.00	-0.00 +0.00
967 – 1101	0.038	$\pm 0.41$	$\pm 2.0$	+0.54 -0.50	+0.02 -0.02	-0.09 +0.08	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
1101 – 1248	0.016	$\pm 0.61$	$\pm 2.0$	+0.44 -0.54	+0.02 -0.02	-0.01 +0.02	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
1248 – 1410	0.0065	$\pm 0.91$	$\pm 2.0$	+0.51 -0.55	+0.02 -0.02	-0.03 +0.03	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
1410 – 1588	0.0027	$\pm 1.35$	$\pm 2.0$	+0.50 -0.53	+0.02 -0.02	-0.01 +0.02	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
1588 – 1784	0.001	$\pm 2.11$	$\pm 2.0$	+0.79 -0.84	+0.02 -0.02	-0.03 +0.03	+0.00 -0.00	+0.00 -0.00	+0.00 -0.00
1784 – 2000	0.00041	$\pm 3.18$	$\pm 2.0$	+0.47 -0.53	+0.02 -0.02	-0.06 +0.06	+0.00 -0.00	+0.00 -0.00	-0.00 +0.00
2000 – 2238	0.00015	$\pm 4.86$	$\pm 2.0$	+0.94 -0.82	+0.02 -0.02	-0.03 +0.03	-0.00 -0.00	+0.00 +0.00	+0.00 +0.00



$|y| < 0.5$

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$p_T$ range in GeV	fakeOutLow [%]	missNoMatch [%]	missOutHigh [%]	missOutLow [%]	AbsoluteMPFBias [%]	AbsoluteScale [%]	AbsoluteStat [%]	FlavorQCD [%]	Fragmentation [%]
74 – 97	+0.02	+0.00	+0.00	+0.00	-0.99	-0.61	+0.00	-3.53	-0.40
	-0.02	-0.00	-0.00	-0.00	+1.90	+1.12	+0.00	+6.64	+0.78
97 – 133	-0.01	+0.00	+0.00	+0.00	-1.12	-0.64	+0.00	-3.15	-0.21
	+0.01	-0.00	-0.00	-0.00	+0.90	+0.49	+0.00	+2.57	+0.12
AK4	+0.00	+0.00	+0.00	+0.00	-1.12	-0.72	+0.00	-2.81	-0.20
AK7	-0.00	-0.00	-0.00	-0.00	+1.23	+0.78	+0.00	+3.15	+0.24
	-0.00	+0.00	+0.00	+0.00	-1.18	-0.68	+0.00	-2.31	-0.09
174 – 220	+0.00	-0.00	-0.00	-0.00	+1.21	+0.79	+0.00	+2.47	+0.13
	+0.00	+0.00	+0.00	+0.00	-1.21	-0.73	+0.00	-2.21	-0.02
Summary & Conclusions	-0.00	-0.00	-0.00	-0.00	+1.20	+0.73	+0.00	+2.13	+0.02
	-0.00	+0.00	+0.00	+0.00	-1.24	-0.77	+0.00	-1.75	+0.09
272 – 330	+0.00	-0.00	-0.00	-0.00	+1.24	+0.74	+0.00	+1.86	-0.10
	+0.00	+0.00	+0.00	+0.00	-1.21	-0.72	+0.00	-1.57	+0.08
Back-up	-0.00	-0.00	-0.00	-0.00	+1.32	+0.67	+0.00	+1.68	-0.07
	-0.00	+0.00	+0.00	+0.00	-1.35	-0.84	+0.00	-1.39	+0.12
330 – 395	+0.00	-0.00	-0.00	-0.00	+1.36	+0.85	+0.00	+1.45	-0.13
	+0.00	+0.00	+0.00	+0.00	-1.34	-0.80	+0.00	-1.16	+0.28
395 – 468	-0.00	-0.00	-0.00	-0.00	+1.42	+0.82	+0.00	+1.17	-0.27
	-0.00	+0.00	+0.00	+0.00	-1.40	-0.87	+0.00	-1.03	+0.17
468 – 548	+0.00	-0.00	-0.00	-0.00	+1.35	+0.83	+0.00	+1.01	-0.17
	-0.00	+0.00	+0.00	+0.00	-1.42	-0.85	+0.00	-0.69	+0.31
548 – 638	+0.00	-0.00	-0.00	-0.00	+1.47	+0.91	+0.00	+0.73	-0.30
	-0.00	+0.01	+0.00	+0.00	-1.53	-0.95	+0.00	-0.53	+0.29
638 – 737	+0.00	-0.01	-0.00	-0.00	+1.53	+0.89	+0.00	+0.53	-0.28
	-0.00	+0.01	+0.00	+0.00	-1.41	-0.83	+0.00	-0.28	+0.34
737 – 846	+0.00	-0.01	-0.00	-0.00	+1.47	+0.92	+0.00	+0.27	-0.36
	-0.00	+0.03	+0.00	+0.00	-1.77	-1.09	+0.00	-0.11	+0.38
846 – 967	+0.00	-0.03	-0.00	-0.00	+1.74	+1.05	+0.00	+0.12	-0.34
	-0.00	+0.06	+0.00	+0.00	-1.71	-1.04	+0.00	-0.09	+0.43
967 – 1101	+0.00	-0.06	-0.00	-0.00	+1.64	+0.93	+0.00	-0.09	-0.53
	-0.00	+0.15	+0.00	+0.00	-1.55	-0.99	+0.00	+0.42	+0.53
1101 – 1248	+0.00	-0.15	-0.00	-0.00	+1.77	+1.22	+0.00	-0.36	-0.35
	-0.00	+0.34	+0.00	+0.00	-2.13	-1.20	+0.00	+0.51	+0.45
1248 – 1410	+0.00	-0.34	-0.00	-0.00	+1.80	+0.91	+0.00	-0.66	-0.74
	-0.00	+0.83	+0.00	+0.00	-1.17	-0.85	+0.00	+0.83	+0.70
1410 – 1588	+0.00	-0.83	-0.00	-0.00	+2.29	+1.28	+0.00	-0.54	-0.46
	-0.00	+2.02	+0.00	+0.00	-3.87	-2.12	+0.00	+1.23	+0.38
1588 – 1784	+0.00	-2.02	-0.00	-0.00	+1.88	+1.45	+0.00	-1.92	-0.82
	-0.00	+5.04	+0.00	+0.00	-0.27	-0.77	+0.00	+0.67	+0.86
1784 – 2000	+0.00	-5.04	-0.00	-0.00	+1.71	+0.83	+0.00	-0.91	-0.95
	-0.00	+13.99	+0.01	+0.00	-3.14	-0.63	+0.00	+4.48	+1.59
2000 – 2238	+0.00	-13.99	-0.01	-0.00	+3.14	+0.63	+0.00	-4.48	-1.59



$|y| < 0.5$

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$p_T$ range in GeV	PileUpDataMC [%]	PileUpPtBB [%]	PileUpPtEC1 [%]	PileUpPtEC2 [%]	PileUpPtHF [%]	PileUpPtRef [%]	RelativeBal [%]	RelativeFSR [%]	RelativeJEREC1 [%]
74 – 97	-0.96	+0.13	+0.21	+0.01	+0.00	-0.17	+0.32	+1.57	+0.37
	+1.41	+0.06	+0.36	+0.02	+0.00	+0.24	+0.90	-1.61	+1.00
97 – 133	-0.62	-0.07	-0.07	-0.00	+0.00	-0.14	-1.00	+1.26	-0.13
	+0.53	+0.03	-0.12	-0.01	+0.00	+0.15	+0.61	-1.13	-0.33
133 – 174	-0.58	-0.11	+0.03	+0.00	+0.00	-0.15	-0.57	+1.00	+0.05
	+0.64	+0.11	+0.05	+0.00	+0.00	+0.12	+0.77	-1.00	+0.14
174 – 220	-0.39	-0.14	-0.01	-0.00	+0.00	-0.11	-0.79	+0.97	-0.01
	+0.47	+0.25	-0.01	-0.00	+0.00	+0.24	+0.94	-0.75	-0.03
220 – 272	-0.33	-0.10	+0.00	+0.00	+0.00	-0.08	-0.83	+0.60	+0.01
	+0.30	+0.07	+0.00	+0.00	+0.00	+0.05	+0.81	-0.69	+0.01
272 – 330	-0.36	-0.11	-0.00	-0.00	+0.00	+0.03	-0.89	+0.44	-0.00
	+0.34	+0.12	+0.00	+0.00	+0.00	-0.01	+0.84	-0.37	-0.01
330 – 395	-0.12	-0.07	+0.00	+0.00	+0.00	-0.06	-0.83	+0.28	-0.00
	+0.14	+0.09	-0.00	+0.00	+0.00	+0.05	+0.86	-0.30	-0.00
395 – 468	-0.26	-0.10	-0.00	+0.00	+0.00	+0.04	-1.00	+0.04	-0.00
	+0.25	+0.09	-0.00	-0.00	+0.00	-0.05	+1.04	-0.04	+0.00
468 – 548	-0.14	+0.01	+0.00	-0.00	+0.00	+0.06	-0.94	-0.06	+0.00
	+0.15	-0.00	+0.00	+0.00	+0.00	-0.05	+0.98	+0.09	-0.00
548 – 638	-0.20	-0.08	+0.00	-0.00	+0.00	+0.05	-1.07	-0.29	+0.00
	+0.19	+0.08	+0.00	+0.00	+0.00	-0.06	+1.02	+0.22	-0.00
638 – 737	-0.11	+0.05	-0.00	+0.00	+0.00	+0.06	-1.05	-0.43	-0.00
	+0.13	-0.04	-0.00	-0.00	+0.00	-0.05	+1.10	+0.48	+0.00
737 – 846	-0.10	+0.04	-0.00	-0.00	+0.00	+0.04	-1.12	-0.73	-0.00
	+0.09	-0.04	-0.00	+0.00	+0.00	-0.04	+1.10	+0.66	+0.00
846 – 967	-0.15	+0.03	+0.00	+0.00	+0.00	+0.10	-1.05	-0.72	+0.00
	+0.16	-0.04	-0.00	-0.00	+0.00	-0.11	+1.10	+0.76	-0.00
967 – 1101	-0.11	+0.12	-0.00	-0.00	+0.00	+0.10	-1.33	-1.15	-0.00
	+0.10	-0.11	-0.00	-0.00	+0.00	-0.09	+1.27	+1.18	-0.00
1101 – 1248	-0.01	+0.09	+0.00	+0.00	+0.00	-0.04	-1.24	-1.37	-0.00
	+0.02	-0.06	-0.00	+0.00	+0.00	+0.04	+1.29	+1.17	-0.00
1248 – 1410	-0.11	+0.19	-0.00	-0.00	+0.00	-0.10	-1.36	-1.27	-0.00
	+0.10	-0.21	+0.00	-0.00	+0.00	+0.10	+1.28	+1.66	+0.00
1410 – 1588	-0.08	+0.11	-0.00	-0.00	+0.00	-0.09	-1.51	-2.09	+0.00
	+0.04	-0.22	+0.00	-0.00	+0.00	+0.04	+1.47	+1.64	-0.00
1588 – 1784	+0.11	+0.26	+0.00	+0.00	+0.00	+0.11	-0.94	-1.44	-0.00
	+0.09	-0.01	+0.00	+0.00	+0.00	+0.10	+1.74	+2.54	+0.00
1784 – 2000	-0.28	+0.30	-0.00	-0.00	+0.00	-0.29	-3.37	-3.95	-0.00
	-0.10	-0.58	-0.01	-0.00	+0.00	-0.11	+1.57	+2.06	-0.00
2000 – 2238	+0.05	+0.10	+0.01	-0.00	+0.00	+0.06	+0.18	-1.05	+0.01
	+0.55	-0.13	+0.00	-0.00	+0.00	+0.62	+1.14	+2.48	-0.00
2238 – 2500	-0.07	+1.48	-0.01	+0.00	+0.00	-0.06	-2.57	-3.65	-0.01
	+0.49	-0.83	-0.02	-0.00	-0.00	-0.74	-4.07	-5.43	-0.00



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$p_T$ range in GeV	RelativeJEREC2 [%]	RelativeJERHF [%]	RelativePtBB [%]	RelativePtEC1 [%]	RelativePtEC2 [%]	RelativePtHF [%]	RelativeSample [%]	RelativeStatEC [%]	RelativeStatFSR [%]
74 – 97	+0.05	+0.00	+0.26	+0.04	+0.01	+0.00	-0.73	+0.12	-0.05
	+0.18	+0.00	-0.24	+0.03	-0.00	+0.00	+2.53	+0.35	+0.16
97 – 133	-0.02	+0.00	+0.17	-0.01	-0.00	+0.00	-1.50	-0.04	-0.07
	-0.06	+0.00	-0.13	-0.01	+0.00	+0.00	+1.01	-0.12	+0.06
AK4 133 – 174	+0.01	+0.00	+0.01	+0.01	+0.00	+0.00	-1.00	+0.02	-0.09
	+0.03	+0.00	-0.07	+0.00	-0.00	+0.00	+1.23	+0.05	+0.07
AK7 174 – 220	-0.00	+0.00	+0.09	-0.00	-0.00	+0.00	-0.97	-0.00	-0.07
	-0.01	+0.00	+0.05	-0.00	-0.00	+0.00	+1.11	-0.01	+0.19
220 – 272	+0.00	+0.00	-0.20	+0.00	+0.00	+0.00	-0.83	+0.00	+0.09
	+0.00	+0.00	+0.15	-0.00	+0.00	+0.00	+0.85	+0.01	+0.07
272 – 330	-0.00	+0.00	-0.11	+0.00	-0.00	+0.00	-0.69	-0.00	+0.10
	+0.00	+0.00	+0.10	-0.00	+0.00	+0.00	+0.68	-0.00	+0.09
330 – 395	+0.00	+0.00	-0.22	-0.00	+0.00	+0.00	-0.54	-0.00	-0.08
	+0.00	+0.00	+0.23	-0.00	+0.00	+0.00	+0.50	-0.00	+0.11
395 – 468	+0.00	+0.00	-0.26	-0.00	+0.00	+0.00	-0.48	-0.00	-0.10
	-0.00	+0.00	+0.25	+0.00	-0.00	+0.00	+0.50	+0.00	+0.07
468 – 548	-0.00	+0.00	-0.37	+0.00	-0.00	+0.00	-0.41	+0.00	-0.10
	+0.00	+0.00	+0.40	+0.00	+0.00	+0.00	+0.40	-0.00	+0.12
548 – 638	-0.00	+0.00	-0.42	+0.00	+0.00	+0.00	-0.23	-0.00	-0.11
	+0.00	+0.00	+0.36	-0.00	+0.00	+0.00	+0.23	-0.00	+0.09
638 – 737	+0.00	+0.00	-0.45	-0.00	+0.00	+0.00	-0.13	-0.00	-0.09
	-0.00	+0.00	+0.51	-0.00	-0.00	+0.00	+0.15	+0.00	+0.11
737 – 846	-0.00	+0.00	-0.57	+0.00	-0.00	+0.00	-0.05	+0.00	-0.12
	+0.00	+0.00	+0.53	-0.00	+0.00	+0.00	+0.03	+0.00	+0.11
846 – 967	-0.00	+0.00	-0.52	-0.00	+0.00	+0.00	+0.08	+0.00	-0.10
	-0.00	+0.00	+0.56	+0.00	-0.00	+0.00	-0.07	-0.00	+0.10
967 – 1101	+0.00	+0.00	-0.73	-0.00	-0.00	+0.00	+0.18	-0.00	-0.14
	+0.00	+0.00	+0.70	-0.00	+0.00	+0.00	-0.25	+0.00	+0.14
1101 – 1248	+0.00	+0.00	-0.76	+0.00	+0.00	+0.00	+0.31	+0.00	-0.07
	-0.00	+0.00	+0.78	-0.00	+0.00	+0.00	-0.20	-0.00	+0.11
1248 – 1410	+0.00	+0.00	-0.73	-0.00	+0.00	+0.00	+0.37	+0.00	-0.17
	+0.00	+0.00	+0.72	+0.00	-0.00	+0.00	-0.52	+0.00	+0.15
1410 – 1588	-0.00	+0.00	-1.00	-0.00	-0.00	+0.00	+0.74	-0.00	-0.21
	-0.00	+0.00	+1.01	-0.00	-0.00	+0.00	-0.59	+0.00	+0.07
1588 – 1784	+0.00	+0.00	-0.79	+0.00	+0.00	+0.00	+0.48	+0.01	+0.12
	+0.00	+0.00	+1.06	+0.00	+0.00	+0.00	-0.44	-0.00	+0.28
1784 – 2000	-0.00	+0.00	-1.58	-0.00	-0.00	+0.00	+1.22	-0.00	-0.48
	-0.00	+0.00	+1.04	-0.00	-0.00	+0.00	-1.49	-0.01	-0.14
2000 – 2238	-0.00	+0.00	-1.28	+0.01	+0.00	+0.00	+0.42	+0.01	+0.01
	+0.00	+0.00	+1.03	+0.00	-0.00	+0.00	-0.93	+0.00	+0.71
2238 – 2500	+0.00	+0.00	+0.41	-0.01	-0.00	+0.00	+3.17	-0.01	-0.07



$|y| < 0.5$

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$p_T$ range in GeV	RelativeStatHF [%]	SinglePionECAL [%]	SinglePionHCAL [%]	TimePtEta [%]
74 – 97	+0.00	+0.88	+0.24	-0.79
	+0.00	-0.45	-0.08	+2.70
97 – 133	+0.00	+0.24	+0.10	-1.46
	+0.00	-0.31	-0.12	+0.92
133 – 174	+0.00	+0.24	+0.10	-1.56
	+0.00	-0.23	-0.09	+1.72
174 – 220	+0.00	+0.17	+0.01	-1.76
	+0.00	-0.10	-0.00	+1.95
220 – 272	+0.00	+0.01	+0.01	-1.96
	+0.00	-0.02	-0.02	+1.91
272 – 330	+0.00	-0.10	-0.01	-2.00
	+0.00	+0.10	+0.01	+2.05
330 – 395	+0.00	-0.05	-0.10	-2.10
	+0.00	+0.06	+0.13	+2.20
395 – 468	+0.00	-0.17	-0.04	-2.27
	+0.00	+0.16	+0.01	+2.35
468 – 548	+0.00	-0.14	-0.13	-2.35
	+0.00	+0.15	+0.15	+2.45
548 – 638	+0.00	-0.34	-0.18	-2.48
	+0.00	+0.34	+0.16	+2.43
638 – 737	+0.00	-0.23	-0.08	-2.55
	+0.00	+0.24	+0.10	+2.63
737 – 846	+0.00	-0.36	-0.21	-2.71
	+0.00	+0.38	+0.19	+2.77
846 – 967	+0.00	-0.36	-0.16	-2.63
	+0.00	+0.31	+0.17	+2.73
967 – 1101	+0.00	-0.38	-0.26	-3.15
	+0.00	+0.44	+0.27	+3.10
1101 – 1248	+0.00	-0.57	-0.39	-3.04
	+0.00	+0.50	+0.32	+3.14
1248 – 1410	+0.00	-0.42	-0.17	-3.25
	+0.00	+0.54	+0.29	+3.25
1410 – 1588	+0.00	-0.60	-0.45	-3.87
	+0.00	+0.41	+0.30	+3.49
1588 – 1784	+0.00	-0.44	-0.39	-2.56
	+0.00	+0.62	+0.47	+4.54
1784 – 2000	+0.00	-0.82	-0.38	-5.11
	+0.00	+0.47	+0.21	+2.74
2000 – 2238	+0.00	-0.95	-0.86	-1.92
	+0.00	+0.89	+0.77	+2.98
2238 – 2500	+0.00	+0.23	+0.04	-4.39



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$p_T$ range in GeV	cross section in pb/GeV	tot. stat. unc. [%]	luminosity [%]	JER [%]	Model [%]	PU [%]	Pref [%]	fakeNoMatch [%]	fakeOutHigh [%]
74 – 97	$3.4 \times 10^4$	$\pm 0.37$	$\pm 2.0$	+0.48 -0.11	-0.01 +0.01	-0.04 -0.04	+0.00 -0.00	+0.01 -0.01	+0.00 +0.00
97 – 133	$9 \times 10^3$	$\pm 0.39$	$\pm 2.0$	+1.59 -1.92	+0.07 -0.07	+0.06 -0.07	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
133 – 174	$2.1 \times 10^3$	$\pm 0.42$	$\pm 2.0$	+0.78 -0.71	+0.06 -0.06	-0.06 +0.07	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
174 – 220	$5.6 \times 10^2$	$\pm 0.33$	$\pm 2.0$	+0.95 -0.93	+0.05 -0.05	-0.03 +0.02	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
220 – 272	$1.7 \times 10^2$	$\pm 0.41$	$\pm 2.0$	+0.71 -0.78	+0.04 -0.04	-0.04 +0.04	-0.01 +0.01	+0.00 -0.00	+0.00 -0.00
272 – 330	57	$\pm 0.38$	$\pm 2.0$	+0.59 -0.67	+0.04 -0.04	-0.06 +0.06	-0.01 +0.01	+0.00 -0.00	+0.00 +0.00
330 – 395	20	$\pm 0.26$	$\pm 2.0$	+0.76 -0.84	+0.03 -0.03	-0.06 +0.06	-0.01 +0.01	+0.00 -0.00	+0.00 -0.00
395 – 468	7.5	$\pm 0.23$	$\pm 2.0$	+0.37 -0.42	+0.03 -0.03	+0.04 +0.04	-0.01 +0.01	+0.00 -0.00	+0.00 +0.00
468 – 548	2.9	$\pm 0.27$	$\pm 2.0$	+0.61 -0.79	+0.03 -0.03	-0.12 +0.12	-0.01 +0.01	+0.00 -0.00	+0.00 +0.00
548 – 638	1.1	$\pm 0.13$	$\pm 2.0$	+0.55 -0.45	+0.03 -0.03	-0.03 +0.03	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
638 – 737	0.45	$\pm 0.16$	$\pm 2.0$	+0.51 -0.66	+0.02 -0.02	-0.09 +0.10	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
737 – 846	0.19	$\pm 0.22$	$\pm 2.0$	+0.64 -0.55	+0.02 -0.02	-0.03 +0.03	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
846 – 967	0.076	$\pm 0.33$	$\pm 2.0$	+0.45 -0.62	+0.02 -0.02	-0.06 +0.06	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
967 – 1101	0.031	$\pm 0.49$	$\pm 2.0$	+0.68 -0.53	+0.02 -0.02	-0.03 +0.03	-0.00 +0.00	+0.00 +0.00	+0.00 +0.00
1101 – 1248	0.013	$\pm 0.73$	$\pm 2.0$	+0.47 -0.68	+0.02 -0.02	-0.09 +0.09	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
1248 – 1410	0.0049	$\pm 1.12$	$\pm 2.0$	+0.73 -0.63	+0.02 -0.02	-0.04 +0.04	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
1410 – 1588	0.0019	$\pm 1.73$	$\pm 2.0$	+0.86 -0.90	+0.02 -0.02	-0.12 +0.10	+0.00 -0.00	+0.00 -0.00	+0.00 -0.00
1588 – 1784	0.00072	$\pm 2.62$	$\pm 2.0$	+0.39 -0.68	+0.02 -0.02	-0.02 +0.04	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
1784 – 2000	0.00024	$\pm 4.40$	$\pm 2.0$	+1.45 -1.18	+0.03 -0.03	-0.04 +0.05	+0.00 -0.00	+0.00 -0.00	+0.00 +0.00
2000 – 2238	$8.4 \times 10^{-5}$	$\pm 6.86$	$\pm 2.0$	+0.21 -0.68	+0.02 -0.02	+0.02 -0.02	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00



$$0.5 < |y| < 1.0$$

	$p_T$ range in GeV	fakeOutLow [%]	missNoMatch [%]	missOutHigh [%]	missOutLow [%]	AbsoluteMPFBias [%]	AbsoluteScale [%]	AbsoluteStat [%]	FlavorQCD [%]	Fragmentation [%]
Introduction	74 – 97	+0.02	+0.00	+0.00	+0.00	-1.00	-0.59	+0.00	-3.62	-0.43
Building blocks	97 – 133	-0.02	-0.00	-0.00	-0.00	+1.96	+1.15	+0.00	+6.64	+0.82
	133 – 174	-0.01	+0.00	+0.00	+0.00	+0.00	-1.21	+0.00	-3.30	-0.25
Unfolding	AK4	+0.01	-0.00	-0.00	-0.00	+0.86	+0.55	+0.00	+2.67	+0.13
	AK7	+0.00	+0.00	+0.00	+0.00	+0.00	-0.98	+0.00	-2.63	-0.20
Result	174 – 220	-0.00	-0.00	-0.00	-0.00	+1.30	+0.80	+0.00	+3.21	+0.29
	220 – 272	-0.00	+0.00	+0.00	+0.00	-1.31	-0.84	+0.00	-2.55	-0.10
Tables	272 – 330	+0.00	-0.00	-0.00	-0.00	+1.02	+0.56	+0.00	+2.42	+0.03
	330 – 395	+0.00	+0.00	+0.00	+0.00	-1.10	-0.65	+0.00	-1.97	-0.02
Summary & Conclusions	395 – 468	-0.00	-0.00	-0.00	-0.00	+1.34	+0.88	+0.00	+2.27	+0.10
	468 – 548	-0.00	+0.00	+0.00	+0.00	-1.37	-0.82	+0.00	-1.96	+0.06
Back-up	548 – 638	+0.00	-0.00	-0.00	-0.00	+1.24	+0.68	+0.00	+1.82	-0.14
	638 – 737	+0.00	+0.00	+0.00	+0.00	-1.26	-0.81	+0.00	-1.65	+0.14
	737 – 846	-0.00	-0.00	-0.00	-0.00	+1.49	+0.97	+0.00	+1.93	-0.08
	846 – 967	-0.00	+0.00	+0.00	+0.00	-1.30	-0.78	+0.00	-1.33	+0.09
	967 – 1101	+0.00	-0.00	-0.00	-0.00	+1.37	+0.80	+0.00	+1.40	-0.13
	1101 – 1248	+0.00	+0.00	+0.00	+0.00	-1.42	-0.87	+0.00	-1.25	+0.29
	1248 – 1410	-0.00	-0.00	-0.00	-0.00	+1.32	+0.78	+0.00	+1.15	-0.29
	1410 – 1588	-0.00	+0.00	+0.00	+0.00	-1.38	-0.84	+0.00	-1.00	+0.17
	1588 – 1784	+0.00	-0.00	-0.00	-0.00	+1.43	+0.89	+0.00	+1.04	-0.15
	1784 – 2000	-0.00	+0.00	+0.00	+0.00	-1.53	-0.93	+0.00	-0.77	+0.31
	2000 – 2238	+0.00	-0.00	-0.00	-0.00	+1.50	+0.91	+0.00	+0.76	-0.35
		-0.00	+0.00	+0.00	+0.00	-1.45	-0.88	+0.00	-0.51	+0.31
		+0.00	-0.00	-0.00	-0.00	+1.56	+0.96	+0.00	+0.53	-0.24
		-0.00	+0.01	+0.00	+0.00	-1.70	-1.06	+0.00	-0.29	+0.33
		+0.00	-0.01	-0.00	-0.00	+1.52	+0.92	+0.00	+0.29	-0.41
		+0.00	+0.03	+0.00	+0.00	-1.46	-0.82	+0.00	-0.08	+0.48
		-0.00	-0.03	-0.00	-0.00	+1.90	+1.08	+0.00	+0.14	-0.32
		-0.00	+0.06	+0.00	+0.00	-1.96	-1.26	+0.00	-0.07	+0.25
		+0.00	-0.06	-0.00	-0.00	+1.42	+0.99	+0.00	-0.11	-0.54
		-0.00	+0.16	+0.00	+0.00	-1.50	-1.02	+0.00	+0.89	+0.93
		+0.00	-0.16	-0.00	-0.00	+2.40	+1.36	+0.00	-0.44	-0.48
		-0.00	+0.40	+0.00	+0.00	-2.66	-1.41	+0.00	-0.01	+0.22
		+0.00	-0.40	-0.00	-0.00	+1.61	+0.93	+0.00	-0.67	-0.70
		-0.00	+1.00	+0.00	+0.00	-1.40	-1.27	+0.00	+1.37	+0.59
		+0.00	-1.00	-0.00	-0.00	+2.47	+1.46	+0.00	-1.03	-0.53
		-0.00	+2.78	+0.00	+0.00	-4.64	-1.86	+0.00	+0.58	+0.73
		+0.00	-2.78	-0.00	-0.00	+2.23	+1.05	+0.00	-1.66	-1.35
		-0.00	+7.66	+0.00	+0.00	+2.21	+1.06	+0.00	+2.76	+1.23
		+0.00	-7.66	-0.00	-0.00	+1.70	+2.36	+0.00	+0.91	+1.20
		+0.00	+2.35	+0.02	+0.00	-0.98	-0.43	+0.00	-1.42	+2.18





$$0.5 < |y| < 1.0$$

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$p_T$ range in GeV	PileUpDataMC [%]	PileUpPtBB [%]	PileUpPtEC1 [%]	PileUpPtEC2 [%]	PileUpPtHF [%]	PileUpPtRef [%]	RelativeBal [%]	RelativeFSR [%]	RelativeJEREC1 [%]
74 – 97	-0.91	+0.05	+0.22	+0.01	+0.00	-0.15	+1.15	+1.08	+0.40
	+1.42	+0.16	+0.38	+0.02	+0.00	+0.25	+0.76	-0.01	+1.05
97 – 133	-0.72	-0.21	-0.08	-0.00	+0.00	-0.20	-0.54	+0.05	-0.14
	+0.56	+0.11	-0.14	-0.01	+0.00	+0.15	-0.16	-0.43	-0.38
133 – 174	-0.43	-0.12	+0.04	+0.00	+0.00	-0.13	+0.10	+0.43	+0.06
	+0.61	+0.19	+0.06	+0.00	+0.00	+0.19	+0.29	-0.17	+0.16
174 – 220	-0.46	-0.12	-0.01	-0.00	+0.00	-0.13	-0.24	+0.14	-0.01
	+0.31	+0.06	-0.01	-0.00	+0.00	+0.08	+0.02	-0.30	-0.04
220 – 272	-0.25	-0.05	+0.00	+0.00	+0.00	-0.09	-0.06	+0.32	+0.01
	+0.37	+0.08	+0.00	+0.00	+0.00	+0.12	+0.20	-0.19	+0.01
272 – 330	-0.31	-0.10	-0.00	-0.00	+0.00	+0.03	-0.30	+0.16	-0.00
	+0.24	+0.09	-0.00	-0.00	+0.00	-0.03	+0.22	-0.24	-0.01
330 – 395	-0.21	-0.01	-0.00	+0.00	+0.00	-0.08	-0.09	+0.25	+0.00
	+0.31	-0.01	+0.00	+0.00	+0.00	+0.07	+0.23	-0.16	-0.00
395 – 468	-0.17	-0.00	-0.00	+0.00	+0.00	+0.06	-0.26	+0.16	-0.00
	+0.16	+0.02	-0.00	-0.00	+0.00	-0.04	+0.24	-0.20	-0.00
468 – 548	-0.19	+0.01	-0.00	-0.00	+0.00	+0.04	-0.22	+0.08	+0.00
	+0.19	-0.02	+0.00	+0.00	+0.00	-0.06	+0.17	-0.10	-0.00
548 – 638	-0.08	-0.00	-0.00	-0.00	+0.00	+0.05	-0.32	+0.19	+0.00
	+0.07	+0.01	+0.00	+0.00	+0.00	-0.04	+0.35	-0.18	-0.00
638 – 737	-0.14	+0.05	-0.00	+0.00	+0.00	+0.06	-0.30	+0.07	+0.00
	+0.13	-0.05	+0.00	-0.00	+0.00	-0.07	+0.28	-0.08	-0.00
737 – 846	-0.11	+0.07	-0.00	+0.00	+0.00	+0.04	-0.29	+0.03	+0.00
	+0.12	-0.06	+0.00	+0.00	+0.00	-0.03	+0.36	+0.01	-0.00
846 – 967	-0.09	+0.06	+0.00	-0.00	+0.00	+0.11	-0.44	+0.05	+0.00
	+0.09	-0.04	+0.00	-0.00	+0.00	-0.11	+0.32	-0.11	-0.00
967 – 1101	-0.06	+0.05	-0.00	+0.00	+0.00	+0.09	-0.19	+0.09	-0.00
	+0.05	-0.06	-0.00	+0.00	+0.00	-0.09	+0.42	+0.11	-0.00
1101 – 1248	-0.04	+0.06	+0.00	+0.00	+0.00	-0.02	-0.63	-0.26	+0.00
	+0.05	-0.06	+0.00	-0.00	+0.00	+0.02	+0.26	-0.16	+0.00
1248 – 1410	-0.13	+0.05	-0.00	-0.00	+0.00	-0.15	-0.21	+0.21	-0.00
	+0.09	-0.09	+0.00	-0.00	+0.00	+0.11	+0.71	+0.38	+0.00
1410 – 1588	-0.01	+0.02	+0.00	+0.00	+0.00	+0.00	-0.79	-0.34	+0.00
	+0.07	-0.02	-0.00	-0.00	+0.00	+0.06	+0.22	-0.08	-0.00
1588 – 1784	-0.09	-0.02	+0.01	-0.00	+0.00	-0.08	-0.35	-0.24	-0.00
	+0.05	+0.03	+0.00	+0.00	+0.00	+0.06	+0.67	-0.18	+0.00
1784 – 2000	-0.28	+0.04	+0.01	-0.00	+0.00	-0.27	-1.41	-0.40	+0.00
	+0.01	-0.17	-0.00	-0.00	+0.00	+0.01	+0.17	+0.96	+0.00
2000 – 2238	+0.33	+0.20	-0.01	+0.00	+0.00	+0.29	+1.21	-0.03	-0.00
	+0.08	+0.31	-0.00	+0.00	+0.00	+0.07	+1.88	-0.51	-0.00
2238 – 2500	-0.57	-0.29	-0.02	-0.00	+0.00	-0.69	-5.32	-0.66	-0.02
	-0.42	0.27	0.02	0.00	0.00	-0.43	0.02	-2.54	-0.02



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$p_T$ range in GeV	RelativeJEREC2 [%]	RelativeJERHF [%]	RelativePtBB [%]	RelativePtEC1 [%]	RelativePtEC2 [%]	RelativePtHF [%]	RelativeSample [%]	RelativeStatEC [%]	RelativeStatFSR [%]
74 - 97	+0.06	+0.00	+0.28	+0.04	+0.01	+0.00	-0.24	+0.12	-0.03
	+0.20	+0.00	-0.26	+0.03	-0.00	+0.00	+2.49	+0.37	+0.17
97 - 133	-0.02	+0.00	+0.16	-0.01	-0.00	+0.00	-1.20	-0.04	-0.10
	-0.07	+0.00	-0.14	-0.01	+0.00	+0.00	+0.39	-0.13	+0.06
133 - 174	+0.01	+0.00	+0.03	+0.01	+0.00	+0.00	-0.29	+0.02	-0.08
	+0.03	+0.00	-0.05	+0.00	-0.00	+0.00	+0.84	+0.06	+0.12
174 - 220	-0.00	+0.00	-0.00	-0.00	-0.00	+0.00	-0.48	-0.00	-0.09
	-0.01	+0.00	-0.03	-0.00	-0.00	+0.00	+0.12	-0.01	+0.04
220 - 272	+0.00	+0.00	-0.09	+0.00	+0.00	+0.00	+0.12	+0.00	-0.06
	+0.00	+0.00	+0.16	-0.00	-0.00	+0.00	+0.16	+0.01	+0.12
272 - 330	-0.00	+0.00	-0.16	+0.00	-0.00	+0.00	+0.10	+0.00	-0.12
	+0.00	+0.00	+0.12	-0.00	+0.00	+0.00	-0.26	-0.00	+0.09
330 - 395	+0.00	+0.00	-0.21	-0.00	+0.00	+0.00	+0.60	-0.00	-0.10
	+0.00	+0.00	+0.27	-0.00	+0.00	+0.00	-0.39	-0.00	+0.08
395 - 468	+0.00	+0.00	-0.30	-0.00	+0.00	+0.00	+0.60	-0.00	-0.09
	-0.00	+0.00	+0.30	-0.00	-0.00	+0.00	-0.60	-0.00	+0.10
468 - 548	-0.00	+0.00	-0.38	+0.00	+0.00	+0.00	+0.82	+0.00	-0.11
	+0.00	+0.00	+0.33	-0.00	+0.00	+0.00	-0.89	-0.00	+0.10
548 - 638	-0.00	+0.00	-0.37	+0.00	-0.00	+0.00	+1.00	+0.00	-0.09
	+0.00	+0.00	+0.39	-0.00	+0.00	+0.00	-0.97	-0.00	+0.09
638 - 737	+0.00	+0.00	-0.53	+0.00	+0.00	+0.00	+1.31	+0.00	-0.13
	-0.00	+0.00	+0.50	-0.00	-0.00	+0.00	-1.34	-0.00	+0.12
737 - 846	+0.00	+0.00	-0.52	-0.00	-0.00	+0.00	+1.52	+0.00	-0.08
	+0.00	+0.00	+0.59	-0.00	+0.00	+0.00	-1.43	-0.00	+0.10
846 - 967	-0.00	+0.00	-0.61	+0.00	+0.00	+0.00	+1.63	+0.00	-0.13
	-0.00	+0.00	+0.51	+0.00	-0.00	+0.00	-1.73	-0.00	+0.12
967 - 1101	+0.00	+0.00	-0.55	-0.00	-0.00	+0.00	+2.18	-0.00	-0.09
	+0.00	+0.00	+0.74	-0.00	+0.00	+0.00	-1.83	-0.00	+0.14
1101 - 1248	-0.00	+0.00	-1.02	+0.00	+0.00	+0.00	+1.93	+0.00	-0.13
	-0.00	+0.00	+0.66	+0.00	-0.00	+0.00	-2.20	+0.00	+0.07
1248 - 1410	+0.00	+0.00	-0.67	-0.00	-0.00	+0.00	+2.86	-0.00	-0.19
	+0.00	+0.00	+1.13	-0.00	+0.00	+0.00	-2.52	+0.00	+0.25
1410 - 1588	-0.00	+0.00	-1.28	-0.00	-0.00	+0.00	+3.00	+0.00	-0.11
	-0.00	+0.00	+0.73	-0.00	+0.00	+0.00	-3.23	-0.00	-0.04
1588 - 1784	-0.00	+0.00	-0.50	-0.00	-0.00	+0.00	+2.49	+0.01	-0.13
	+0.00	+0.00	+1.17	+0.00	+0.00	+0.00	-2.43	+0.00	+0.35
1784 - 2000	-0.00	+0.00	-2.49	+0.00	+0.00	+0.00	+4.21	+0.01	-0.41
	-0.00	+0.00	+0.93	-0.00	-0.00	+0.00	-5.62	-0.00	-0.20
2000 - 2238	-0.00	+0.00	+1.26	-0.00	-0.00	+0.00	+3.97	-0.01	+0.51
	+0.00	+0.00	+2.47	-0.00	+0.00	+0.00	+0.36	+0.00	+0.93
2238 - 2500	+0.00	+0.00	-4.66	-0.02	+0.00	+0.00	+8.93	-0.01	-1.58



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$p_T$ range in GeV	RelativeStatHF [%]	SinglePionECAL [%]	SinglePionHCAL [%]	TimePtEta [%]
74 – 97	+0.00	+0.90	+0.24	-1.57
	+0.00	-0.44	-0.08	+2.85
97 – 133	+0.00	+0.26	+0.11	-1.97
	+0.00	-0.41	-0.15	+1.61
133 – 174	+0.00	+0.28	+0.11	-1.85
	+0.00	-0.18	-0.09	+2.14
174 – 220	+0.00	+0.07	-0.01	-2.42
	+0.00	-0.13	-0.00	+2.30
220 – 272	+0.00	+0.09	+0.03	-2.01
	+0.00	-0.01	-0.02	+2.25
272 – 330	+0.00	-0.14	-0.01	-2.58
	+0.00	+0.06	+0.02	+2.38
330 – 395	+0.00	-0.06	-0.12	-2.34
	+0.00	+0.12	+0.09	+2.82
395 – 468	+0.00	-0.17	-0.02	-2.56
	+0.00	+0.14	+0.04	+2.62
468 – 548	+0.00	-0.14	-0.15	-2.66
	+0.00	+0.15	+0.12	+2.59
548 – 638	+0.00	-0.32	-0.16	-2.53
	+0.00	+0.33	+0.17	+2.61
638 – 737	+0.00	-0.28	-0.13	-2.89
	+0.00	+0.25	+0.11	+2.85
737 – 846	+0.00	-0.32	-0.15	-2.68
	+0.00	+0.38	+0.19	+2.90
846 – 967	+0.00	-0.43	-0.24	-3.14
	+0.00	+0.34	+0.18	+2.92
967 – 1101	+0.00	-0.32	-0.18	-2.75
	+0.00	+0.50	+0.30	+3.27
1101 – 1248	+0.00	-0.64	-0.42	-3.42
	+0.00	+0.34	+0.25	+3.01
1248 – 1410	+0.00	-0.49	-0.26	-3.06
	+0.00	+0.94	+0.44	+3.70
1410 – 1588	+0.00	-0.60	-0.53	-3.93
	+0.00	+0.15	+0.24	+3.71
1588 – 1784	+0.00	-0.50	-0.08	-3.96
	+0.00	+0.53	+0.48	+3.06
1784 – 2000	+0.00	-1.46	-1.21	-5.48
	+0.00	+0.79	+0.19	+5.79
2000 – 2238	+0.00	+1.20	+0.85	-0.88
	+0.00	+1.37	+1.44	+2.60
2238 – 2500	+0.00	-3.59	-3.33	-10.58



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	$p_T$ range in GeV	cross section in pb/GeV	tot. stat. unc. [%]	luminosity [%]	JER [%]	Model [%]	PU [%]	Pref [%]	fakeNoMatch [%]	fakeOutHigh [%]
	74 – 97	$3 \times 10^4$	$\pm 0.42$	$\pm 2.0$	+0.01 +0.52	-0.01 +0.01	+0.03 -0.04	+0.01 -0.01	+0.01 -0.01	+0.00 -0.00
	97 – 133	$8 \times 10^3$	$\pm 0.46$	$\pm 2.0$	+3.56 -3.80	+0.08 -0.09	-0.08 +0.07	-0.01 +0.01	+0.00 +0.00	-0.00 +0.00
	133 – 174	$1.8 \times 10^3$	$\pm 0.50$	$\pm 2.0$	+1.15 -1.61	+0.07 -0.07	-0.19 +0.20	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
	174 – 220	$4.9 \times 10^2$	$\pm 0.38$	$\pm 2.0$	+1.63 -1.76	+0.06 -0.06	-0.02 +0.03	-0.01 +0.01	+0.00 -0.00	-0.00 +0.00
	220 – 272	$1.5 \times 10^2$	$\pm 0.49$	$\pm 2.0$	+1.36 -1.51	+0.05 -0.05	-0.20 +0.20	-0.01 +0.01	+0.00 -0.00	+0.00 -0.00
	272 – 330	48	$\pm 0.47$	$\pm 2.0$	+1.05 -1.23	+0.04 -0.04	-0.02 +0.02	-0.01 +0.01	+0.00 -0.00	+0.00 -0.00
	330 – 395	17	$\pm 0.33$	$\pm 2.0$	+1.17 -1.37	+0.04 -0.04	-0.17 +0.17	-0.01 +0.01	+0.00 -0.00	-0.00 +0.00
	395 – 468	6	$\pm 0.30$	$\pm 2.0$	+1.04 -1.13	+0.04 -0.04	-0.13 +0.13	-0.01 +0.01	+0.00 -0.00	+0.00 -0.00
	468 – 548	2.2	$\pm 0.35$	$\pm 2.0$	+1.23 -1.38	+0.04 -0.04	-0.13 +0.13	-0.01 +0.01	+0.00 -0.00	-0.00 +0.00
	548 – 638	0.86	$\pm 0.19$	$\pm 2.0$	+1.13 -1.01	+0.03 -0.03	-0.08 +0.09	-0.01 +0.01	+0.00 -0.00	-0.00 +0.00
	638 – 737	0.32	$\pm 0.24$	$\pm 2.0$	+1.16 -1.55	+0.03 -0.03	-0.18 +0.18	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
	737 – 846	0.13	$\pm 0.34$	$\pm 2.0$	+1.22 -1.09	+0.03 -0.03	-0.04 +0.05	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
	846 – 967	0.047	$\pm 0.53$	$\pm 2.0$	+1.30 -1.63	+0.03 -0.03	-0.21 +0.20	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
	967 – 1101	0.018	$\pm 0.82$	$\pm 2.0$	+1.39 -1.49	+0.03 -0.03	-0.03 +0.04	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
	1101 – 1248	0.0062	$\pm 1.33$	$\pm 2.0$	+1.82 -2.00	+0.04 -0.04	-0.20 +0.20	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
	1248 – 1410	0.0021	$\pm 2.15$	$\pm 2.0$	+1.38 -1.55	+0.03 -0.03	-0.11 +0.11	+0.00 -0.00	+0.00 -0.00	+0.00 -0.00
	1410 – 1588	0.00066	$\pm 3.69$	$\pm 2.0$	+3.09 -3.23	+0.04 -0.04	-0.05 +0.06	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
	1588 – 1784	0.00018	$\pm 6.75$	$\pm 2.0$	+2.77 -2.77	+0.03 -0.03	-0.14 +0.12	+0.00 -0.00	+0.00 -0.00	+0.00 -0.00
	1784 – 2000	$4.6 \times 10^{-5}$	$\pm 12.48$	$\pm 2.0$	+3.14 -4.79	+0.04 -0.04	+0.05 -0.01	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
	2000 – 2238	$1.2 \times 10^{-5}$	$\pm 21.74$	$\pm 2.0$	+4.06 2.10	+0.05 0.04	-0.42 -0.42	+0.00 0.00	-0.00 -0.00	+0.00 0.00



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$p_T$ range in GeV	fakeOutLow [%]	missNoMatch [%]	missOutHigh [%]	missOutLow [%]	AbsoluteMPFBias [%]	AbsoluteScale [%]	AbsoluteStat [%]	FlavorQCD [%]	Fragmentation [%]
74 - 97	+0.03	+0.00	+0.00	+0.00	-1.06	-0.63	+0.00	-3.87	-0.50
	-0.03	-0.00	-0.00	-0.00	+2.41	+1.46	+0.00	+8.38	+1.05
97 - 133	-0.01	+0.00	+0.00	+0.00	-1.15	-0.71	+0.00	-3.29	-0.26
	+0.01	-0.00	-0.00	-0.00	+0.81	+0.53	+0.00	+2.33	+0.16
AK4 133 - 174	+0.01	+0.00	+0.00	+0.00	-1.12	-0.66	+0.00	-2.97	-0.23
	-0.01	-0.00	-0.00	-0.00	+1.31	+0.83	+0.00	+3.59	+0.31
AK7 174 - 220	-0.00	+0.00	+0.00	+0.00	-1.30	-0.84	+0.00	-2.57	-0.06
	+0.00	-0.00	-0.00	-0.00	+1.27	+0.72	+0.00	+2.49	+0.01
Summary & Conclusions 220 - 272	+0.00	+0.00	+0.00	+0.00	-1.22	-0.72	+0.00	-2.27	-0.09
	-0.00	-0.00	-0.00	-0.00	+1.22	+0.71	+0.00	+2.34	+0.10
272 - 330	-0.00	+0.00	+0.00	+0.00	-1.37	-0.79	+0.00	-1.98	+0.09
	+0.00	-0.00	-0.00	-0.00	+1.43	+0.88	+0.00	+2.09	-0.08
Back-up 330 - 395	+0.00	+0.00	+0.00	+0.00	-1.31	-0.86	+0.00	-1.77	+0.14
	-0.00	-0.00	-0.00	-0.00	+1.34	+0.83	+0.00	+1.78	-0.12
395 - 468	-0.00	+0.00	+0.00	+0.00	-1.46	-0.82	+0.00	-1.54	+0.10
	+0.00	-0.00	-0.00	-0.00	+1.43	+0.84	+0.00	+1.58	-0.08
468 - 548	+0.00	+0.00	+0.00	+0.00	-1.40	-0.89	+0.00	-1.26	+0.25
	-0.00	-0.00	-0.00	-0.00	+1.38	+0.84	+0.00	+1.22	-0.29
548 - 638	-0.00	+0.00	+0.00	+0.00	-1.43	-0.87	+0.00	-1.06	+0.25
	+0.00	-0.00	-0.00	-0.00	+1.59	+1.00	+0.00	+1.22	-0.20
638 - 737	+0.00	+0.00	+0.00	+0.00	-1.66	-1.00	+0.00	-0.86	+0.30
	-0.00	-0.00	-0.00	-0.00	+1.62	+0.96	+0.00	+0.82	-0.30
737 - 846	-0.00	+0.01	+0.00	+0.00	-1.67	-1.03	+0.00	-0.59	+0.35
	+0.00	-0.01	-0.00	-0.00	+1.68	+1.02	+0.00	+0.58	-0.38
846 - 967	+0.00	+0.02	+0.00	+0.00	-1.76	-1.05	+0.00	-0.35	+0.34
	-0.00	-0.02	-0.00	-0.00	+1.72	+1.08	+0.00	+0.38	-0.34
967 - 1101	-0.00	+0.05	+0.00	+0.00	-1.87	-1.23	+0.00	-0.09	+0.55
	+0.00	-0.05	-0.00	-0.00	+2.16	+1.28	+0.00	+0.01	-0.56
1101 - 1248	+0.00	+0.13	+0.00	+0.00	-2.11	-1.01	+0.00	-0.03	+0.32
	-0.00	-0.13	-0.00	-0.00	+1.47	+0.86	+0.00	+0.13	-0.15
1248 - 1410	-0.00	+0.35	+0.00	+0.00	-2.26	-1.83	+0.00	+1.19	+1.40
	+0.00	-0.35	-0.00	-0.00	+3.67	+2.36	+0.00	-1.04	-1.24
1410 - 1588	-0.00	+1.10	+0.00	+0.00	-2.73	-0.96	+0.00	-0.36	-0.60
	+0.00	-1.10	-0.00	-0.00	+0.39	+0.05	+0.00	-0.32	-0.17
1588 - 1784	+0.00	+3.88	+0.00	+0.00	-1.87	-1.99	+0.00	+2.54	+2.28
	-0.00	-3.88	-0.00	-0.00	+5.21	+3.10	+0.00	-1.31	-1.38
1784 - 2000	-0.00	+14.07	+0.00	+0.03	-7.65	-5.39	+0.00	+2.04	-0.05
	+0.00	-14.07	-0.00	-0.03	+3.01	+1.40	+0.00	-4.85	-2.55
2000 - 2238	+0.00	+52.90	+0.00	+0.00	-2.94	-6.54	+0.00	+2.12	+6.36
	-0.00	-52.90	-0.00	-0.00	+1.50	+5.83	+0.00	-4.15	-7.53
	+0.00	+1063.21	+0.00	+0.79	-87.95	-107.58	+0.00	+18.29	+37.80



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$p_T$ range in GeV	PileUpDataMC [%]	PileUpPttBB [%]	PileUpPttEC1 [%]	PileUpPttEC2 [%]	PileUpPttHF [%]	PileUpPttRef [%]	RelativeBal [%]	RelativeSR [%]	RelativeJEREC1 [%]
74 – 97	-0.75	-0.58	-0.08	+0.01	+0.00	-0.11	+2.01	+1.38	-0.06
	+1.72	+0.41	+0.57	+0.02	+0.00	+0.29	-0.80	+0.49	+1.38
97 – 133	-0.64	-0.26	-0.20	-0.00	+0.00	-0.24	+0.60	-0.50	-0.43
	+0.40	+0.45	+0.05	-0.01	+0.00	+0.18	-0.86	-0.21	-0.05
133 – 174	-0.40	-0.19	-0.02	+0.00	+0.00	-0.13	+0.57	+0.26	-0.22
	+0.56	+0.11	+0.09	+0.00	+0.00	+0.17	-0.44	+0.13	+0.44
174 – 220	-0.39	-0.06	-0.02	-0.00	+0.00	-0.12	+0.40	-0.12	-0.30
	+0.27	+0.11	+0.00	-0.00	+0.00	+0.08	-0.41	-0.02	+0.30
220 – 272	-0.28	+0.05	+0.03	+0.00	+0.00	-0.12	-0.03	-0.11	-0.23
	+0.29	-0.08	-0.02	+0.00	+0.00	+0.15	-0.03	+0.12	+0.24
272 – 330	-0.23	+0.05	+0.02	-0.00	+0.00	+0.00	-0.11	-0.09	-0.20
	+0.22	-0.03	-0.03	-0.00	+0.00	-0.01	+0.22	+0.10	+0.19
330 – 395	-0.18	+0.18	+0.10	+0.00	+0.00	-0.04	+0.36	-0.20	-0.25
	+0.24	-0.15	-0.08	+0.00	+0.00	+0.05	+0.35	+0.17	+0.23
395 – 468	-0.15	+0.14	+0.03	+0.00	+0.00	+0.00	-0.65	-0.14	-0.14
	+0.13	-0.15	-0.03	-0.00	+0.00	-0.02	+0.63	+0.19	+0.18
468 – 548	-0.09	+0.13	+0.07	+0.00	+0.00	+0.08	-0.67	-0.27	-0.21
	+0.11	-0.12	-0.08	+0.00	+0.00	-0.06	+0.67	+0.20	+0.15
548 – 638	-0.15	+0.16	+0.03	-0.00	+0.00	+0.04	-0.99	-0.21	-0.12
	+0.14	-0.15	-0.04	+0.00	+0.00	-0.06	+1.13	+0.25	+0.17
638 – 737	-0.06	+0.11	+0.04	+0.00	+0.00	+0.08	-1.27	-0.30	-0.18
	+0.09	-0.10	-0.04	-0.00	+0.00	-0.04	+1.21	+0.33	+0.15
737 – 846	-0.08	+0.06	+0.02	-0.00	+0.00	+0.02	-1.45	-0.28	-0.09
	+0.02	-0.09	-0.01	+0.00	+0.00	-0.08	+1.46	+0.25	+0.11
846 – 967	-0.04	+0.05	-0.00	+0.00	+0.00	+0.13	-1.74	-0.36	-0.11
	+0.12	+0.01	-0.01	-0.00	+0.00	-0.08	+1.81	+0.38	+0.11
967 – 1101	-0.06	-0.13	-0.05	-0.00	+0.00	+0.08	-2.09	-0.54	-0.12
	+0.01	+0.01	+0.05	+0.00	+0.00	-0.09	+2.18	+0.54	+0.11
1101 – 1248	-0.01	+0.07	+0.01	+0.00	+0.00	+0.06	-2.52	-0.12	-0.01
	+0.10	+0.16	+0.01	+0.00	+0.00	-0.03	+2.09	+0.10	+0.03
1248 – 1410	-0.25	-0.74	-0.10	-0.00	+0.00	-0.36	-2.85	-0.87	-0.12
	+0.13	+0.53	+0.20	-0.00	+0.00	+0.33	+4.52	+1.07	+0.17
1410 – 1588	+0.09	-0.00	-0.11	-0.00	+0.00	+0.25	-3.99	-0.08	+0.08
	-0.07	-0.07	-0.28	-0.00	+0.00	-0.37	+0.68	-0.16	-0.12
1588 – 1784	-0.18	-0.83	-0.07	+0.00	+0.00	-0.57	-3.00	-0.81	-0.21
	+0.12	+0.67	+1.02	+0.00	+0.00	+0.64	+7.83	+1.45	+0.31
1784 – 2000	+0.17	-2.54	-0.44	-0.00	+0.00	+0.40	-10.36	-0.51	-0.31
	-0.08	+1.76	-1.43	-0.00	+0.00	-0.43	+5.14	-1.51	-0.31
2000 – 2238	-0.10	+5.47	+2.30	+0.00	+0.00	-0.26	-1.36	+2.68	+2.18
	+0.01	+5.01	+2.01	+0.00	+0.00	+0.27	+4.58	+3.00	+0.25
2238 – 2500	+0.61	-61.43	-52.13	-0.00	+0.00	+1.35	-89.75	-59.35	-51.67
	0.05	17.99	14.33	0.00	0.00	1.87	15.68	19.84	1.16



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$p_T$ range in GeV	RelativeJEREC2 [%]	RelativeJERHF [%]	RelativePtBB [%]	RelativePtEC1 [%]	RelativePtEC2 [%]	RelativePtHF [%]	RelativeSample [%]	RelativeStatEC [%]	RelativeStatFSR [%]
74 – 97	+0.07	+0.00	+0.34	+0.06	+0.01	+0.00	-3.10	+0.02	-0.05
	+0.24	+0.00	-0.25	-0.00	-0.00	+0.00	+4.01	+0.50	+0.23
97 – 133	-0.03	+0.00	+0.16	-0.00	-0.00	+0.00	-2.03	-0.05	-0.13
	-0.10	+0.00	-0.13	-0.02	+0.00	+0.00	+2.16	-0.15	+0.07
133 – 174	+0.01	+0.00	+0.08	+0.02	+0.00	+0.00	-1.49	-0.01	-0.07
	+0.05	+0.00	-0.05	+0.01	-0.00	+0.00	+1.58	+0.09	+0.13
174 – 220	-0.00	+0.00	+0.01	+0.00	-0.00	+0.00	-0.68	-0.11	-0.10
	-0.01	+0.00	-0.04	-0.01	-0.00	+0.00	+0.56	+0.12	+0.09
220 – 272	+0.00	+0.00	-0.15	-0.00	+0.00	+0.00	-0.24	+0.09	-0.14
	+0.01	+0.00	+0.15	+0.01	+0.00	+0.00	+0.20	+0.09	+0.10
272 – 330	-0.00	+0.00	-0.13	-0.01	-0.00	+0.00	+0.61	-0.09	-0.07
	-0.00	+0.00	+0.13	+0.01	+0.00	+0.00	-0.52	+0.08	+0.12
330 – 395	+0.00	+0.00	-0.22	-0.02	+0.00	+0.00	+1.02	-0.16	-0.14
	+0.00	+0.00	+0.23	+0.02	+0.00	+0.00	-1.02	+0.17	+0.11
395 – 468	-0.00	+0.00	-0.28	-0.01	-0.00	+0.00	+1.61	-0.11	-0.08
	-0.00	+0.00	+0.27	+0.01	-0.00	+0.00	-1.70	+0.13	+0.08
468 – 548	-0.00	+0.00	-0.38	-0.05	+0.00	+0.00	+2.07	-0.19	-0.11
	+0.00	+0.00	+0.36	+0.05	+0.00	+0.00	-2.07	+0.14	+0.12
548 – 638	-0.00	+0.00	-0.41	-0.01	-0.00	+0.00	+2.79	-0.13	-0.12
	-0.00	+0.00	+0.50	+0.01	+0.00	+0.00	-2.74	+0.17	+0.13
638 – 737	+0.00	+0.00	-0.51	-0.04	+0.00	+0.00	+3.51	-0.20	-0.12
	+0.00	+0.00	+0.48	+0.03	-0.00	+0.00	-3.37	+0.19	+0.12
737 – 846	-0.00	+0.00	-0.64	-0.02	-0.00	+0.00	+3.98	-0.17	-0.14
	-0.00	+0.00	+0.61	+0.04	+0.00	+0.00	-3.98	+0.18	+0.11
846 – 967	+0.00	+0.00	-0.66	-0.05	+0.00	+0.00	+5.12	-0.19	-0.12
	+0.00	+0.00	+0.70	+0.03	-0.00	+0.00	-5.04	+0.17	+0.17
967 – 1101	+0.00	+0.00	-0.82	-0.03	-0.00	+0.00	+5.52	-0.25	-0.20
	-0.00	+0.00	+0.84	+0.05	+0.00	+0.00	-5.21	+0.27	+0.11
1101 – 1248	-0.00	+0.00	-0.86	-0.03	+0.00	+0.00	+6.71	-0.18	+0.00
	+0.00	+0.00	+0.79	+0.05	-0.00	+0.00	-7.08	+0.11	+0.17
1248 – 1410	-0.00	+0.00	-1.47	-0.06	-0.00	+0.00	+9.75	-0.12	-0.45
	-0.00	+0.00	+1.73	+0.08	-0.00	+0.00	-7.05	+0.30	+0.44
1410 – 1588	-0.00	+0.00	-1.05	+0.06	+0.00	+0.00	+6.81	-0.19	+0.17
	+0.00	+0.00	+0.71	-0.04	-0.00	+0.00	-11.04	-0.03	-0.33
1588 – 1784	+0.00	+0.00	-1.85	-0.20	-0.00	+0.00	+16.55	-0.13	-0.70
	-0.00	+0.00	+1.71	+0.25	+0.00	+0.00	-8.22	+0.97	+0.83
1784 – 2000	-0.00	+0.00	-4.27	-0.32	+0.00	+0.00	+9.40	-0.51	+0.12
	+0.00	+0.00	+4.08	-0.25	-0.00	+0.00	-18.25	-1.45	-0.82
2000 – 2238	+0.00	+0.00	+0.43	+2.18	-0.00	+0.00	+21.18	+2.39	+1.94
	+0.00	+0.00	-0.44	+0.21	+0.00	+0.00	-7.78	+1.97	+1.68
2238 – 2500	-0.00	+0.00	-37.64	-51.69	+0.00	+0.00	+69.59	-52.53	-50.36



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$p_T$ range in GeV	RelativeStatHF [%]	SinglePionECAL [%]	SinglePionHCAL [%]	TimePtEta [%]
74 – 97	+0.00	+1.15	+0.31	-2.33
	+0.00	-0.48	-0.12	+3.73
97 – 133	+0.00	+0.31	+0.12	-2.13
	+0.00	-0.43	-0.14	+2.04
133 – 174	+0.00	+0.29	+0.11	-2.12
	+0.00	-0.22	-0.09	+2.19
174 – 220	+0.00	+0.08	+0.05	-2.60
	+0.00	-0.13	-0.04	+2.63
220 – 272	+0.00	+0.07	-0.01	-2.29
	+0.00	-0.07	-0.02	+2.39
272 – 330	+0.00	-0.07	+0.05	-2.61
	+0.00	+0.09	-0.02	+2.72
330 – 395	+0.00	-0.10	-0.13	-2.49
	+0.00	+0.12	+0.12	+2.60
395 – 468	+0.00	-0.13	-0.03	-2.75
	+0.00	+0.15	+0.04	+2.70
468 – 548	+0.00	-0.16	-0.10	-2.64
	+0.00	+0.13	+0.09	+2.59
548 – 638	+0.00	-0.31	-0.20	-2.68
	+0.00	+0.35	+0.21	+2.94
638 – 737	+0.00	-0.31	-0.12	-2.86
	+0.00	+0.32	+0.14	+2.87
737 – 846	+0.00	-0.36	-0.20	-2.90
	+0.00	+0.32	+0.15	+2.93
846 – 967	+0.00	-0.48	-0.24	-2.93
	+0.00	+0.48	+0.30	+3.02
967 – 1101	+0.00	-0.45	-0.31	-3.12
	+0.00	+0.44	+0.18	+3.37
1101 – 1248	+0.00	-0.40	-0.17	-3.36
	+0.00	+0.54	+0.46	+2.76
1248 – 1410	+0.00	-1.09	-0.84	-3.19
	+0.00	+1.24	+0.65	+5.14
1410 – 1588	+0.00	-0.14	+0.20	-4.47
	+0.00	-0.43	-0.10	+1.19
1588 – 1784	+0.00	-1.63	-1.67	-2.07
	+0.00	+1.86	+1.07	+8.12
1784 – 2000	+0.00	-1.34	-0.34	-11.12
	+0.00	+0.28	-0.29	+2.50
2000 – 2238	+0.00	+2.91	+2.34	+3.42
	+0.00	+6.14	+5.89	+3.70
2238 – 2500	+0.00	-55.50	-52.51	-106.60





$$1.5 < |y| < 2.0$$

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	$p_T$ range in GeV	cross section in pb/GeV	tot. stat. unc. [%]	luminosity [%]	JER [%]	Model [%]	PU [%]	Pref [%]	fakeNoMatch [%]	fakeOutHigh [%]
	74 – 97	$2.5 \times 10^4$	$\pm 0.44$	$\pm 2.0$	+0.12 +0.54	-0.01 +0.01	+0.06 -0.06	-0.00 +0.00	+0.01 -0.01	+0.00 -0.00
	97 – 133	$6.4 \times 10^3$	$\pm 0.48$	$\pm 2.0$	+3.59 -4.26	+0.08 -0.08	-0.42 +0.42	-0.01 +0.01	+0.01 -0.01	+0.00 -0.00
	133 – 174	$1.4 \times 10^3$	$\pm 0.51$	$\pm 2.0$	+1.26 -1.29	+0.06 -0.07	-0.43 +0.43	-0.01 +0.01	+0.00 -0.00	+0.00 +0.00
	174 – 220	$3.8 \times 10^2$	$\pm 0.39$	$\pm 2.0$	+1.58 -1.90	+0.05 -0.05	-0.28 +0.30	-0.01 +0.01	+0.00 -0.00	+0.00 -0.00
	220 – 272	$1.1 \times 10^2$	$\pm 0.50$	$\pm 2.0$	+1.04 -1.37	+0.04 -0.05	-0.35 +0.35	-0.02 +0.02	+0.00 -0.00	+0.00 +0.00
	272 – 330	36	$\pm 0.46$	$\pm 2.0$	+1.19 -1.12	+0.04 -0.04	-0.36 +0.37	-0.02 +0.02	+0.00 -0.00	+0.00 -0.00
	330 – 395	12	$\pm 0.33$	$\pm 2.0$	+1.02 -1.21	+0.04 -0.04	-0.30 +0.31	-0.02 +0.02	+0.00 -0.00	+0.00 +0.00
	395 – 468	4.1	$\pm 0.30$	$\pm 2.0$	+1.04 -1.20	+0.03 -0.03	-0.30 +0.31	-0.02 +0.01	+0.00 -0.00	+0.00 -0.00
	468 – 548	1.4	$\pm 0.36$	$\pm 2.0$	+1.17 -1.25	+0.03 -0.03	-0.26 +0.27	-0.01 +0.01	+0.00 -0.00	+0.00 +0.00
	548 – 638	0.48	$\pm 0.18$	$\pm 2.0$	+1.09 -1.16	+0.03 -0.03	-0.25 +0.26	-0.01 +0.01	+0.00 -0.00	+0.00 -0.00
	638 – 737	0.16	$\pm 0.24$	$\pm 2.0$	+1.25 -1.41	+0.03 -0.03	-0.41 +0.41	-0.01 +0.01	+0.00 -0.00	+0.00 +0.00
	737 – 846	0.052	$\pm 0.39$	$\pm 2.0$	+1.54 -1.47	+0.03 -0.03	-0.23 +0.25	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
	846 – 967	0.016	$\pm 0.67$	$\pm 2.0$	+1.45 -2.04	+0.03 -0.03	-0.35 +0.36	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
	967 – 1101	0.0043	$\pm 1.22$	$\pm 2.0$	+2.11 -1.99	+0.03 -0.03	-0.28 +0.28	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
	1101 – 1248	0.0011	$\pm 2.34$	$\pm 2.0$	+2.49 -2.95	+0.04 -0.04	-0.43 +0.43	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
	1248 – 1410	0.00019	$\pm 5.95$	$\pm 2.0$	+5.28 -5.60	+0.04 -0.04	-0.27 +0.29	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
	1410 – 1588	$4.6 \times 10^{-5}$	$\pm 10.96$	$\pm 2.0$	+4.39 -3.87	+0.05 -0.05	-0.93 +0.93	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
	1588 – 1784	$2.1 \times 10^{-6}$	$\pm 97.54$	$\pm 2.0$	+31.22 -42.18	+0.25 -0.24	+1.71 -1.97	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
	1784 – 2000	$1.7 \times 10^{-6}$	$\pm 85.69$	$\pm 2.0$	+6.18 -3.71	-0.01 -0.01	-0.60 +0.97	+0.00 -0.00	+0.00 -0.00	+0.00 -0.00
	2000 – 2238	$8.3 \times 10^{-7}$	$\pm 72.10$	$\pm 2.0$	+1.84 -20.65	+0.05 -0.05	-3.23 +3.53	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00



$$1.5 < |y| < 2.0$$

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$p_T$ range in GeV	fakeOutLow [%]	missNoMatch [%]	missOutHigh [%]	missOutLow [%]	AbsoluteMPFBias [%]	AbsoluteScale [%]	AbsoluteStat [%]	FlavorQCD [%]	Fragmentation [%]
74 - 97	+0.02	+0.00	+0.00	+0.00	-1.02	-0.66	+0.00	-3.88	-0.54
	-0.02	-0.00	-0.00	-0.00	+2.14	+1.31	+0.00	+7.81	+0.95
97 - 133	-0.01	+0.00	+0.00	+0.00	-1.17	-0.66	+0.00	-3.53	-0.25
	+0.01	-0.00	-0.00	-0.00	+0.99	+0.59	+0.00	+2.68	+0.17
AK4	+0.01	+0.00	+0.00	+0.00	-1.11	-0.71	+0.00	-2.83	-0.25
AK7	-0.01	-0.00	-0.00	-0.00	+1.46	+0.82	+0.00	+3.78	+0.32
	-0.00	+0.00	+0.00	+0.00	-1.40	-0.88	+0.00	-2.81	-0.10
174 - 220	+0.00	-0.00	-0.00	-0.00	+1.06	+0.60	+0.00	+2.41	+0.02
	+0.00	+0.00	+0.00	+0.00	-1.22	-0.68	+0.00	-2.30	-0.07
Summary & Conclusions	-0.00	-0.00	-0.00	-0.00	+1.30	+0.74	+0.00	+2.52	+0.09
	-0.00	+0.00	+0.00	+0.00	-1.34	-0.88	+0.00	-1.92	+0.08
272 - 330	+0.00	-0.00	-0.00	-0.00	+1.32	+0.76	+0.00	+1.97	-0.09
	+0.00	+0.00	+0.00	+0.00	-1.37	-0.75	+0.00	-1.81	+0.08
Back-up	-0.00	-0.00	-0.00	-0.00	+1.33	+0.85	+0.00	+1.86	-0.08
	-0.00	+0.00	+0.00	+0.00	-1.54	-1.04	+0.00	-1.65	+0.14
330 - 395	+0.00	-0.00	-0.00	-0.00	+1.52	+0.89	+0.00	+1.58	-0.18
	+0.00	+0.00	+0.00	+0.00	-1.57	-0.85	+0.00	-1.29	+0.28
395 - 468	-0.00	-0.00	-0.00	-0.00	+1.53	+0.93	+0.00	+1.34	-0.25
	-0.00	+0.00	+0.00	+0.00	-1.70	-1.09	+0.00	-1.18	+0.28
468 - 548	+0.00	-0.00	-0.00	-0.00	+1.89	+1.20	+0.00	+1.31	-0.28
	-0.00	+0.01	+0.00	+0.00	-1.88	-1.09	+0.00	-0.85	+0.37
548 - 638	+0.00	-0.01	-0.00	-0.00	+1.80	+1.08	+0.00	+0.78	-0.36
	-0.00	+0.02	+0.00	+0.00	-2.08	-1.27	+0.00	-0.60	+0.42
638 - 737	+0.00	-0.02	-0.00	-0.00	+2.10	+1.21	+0.00	+0.68	-0.47
	-0.00	+0.05	+0.00	+0.00	-2.36	-1.52	+0.00	-0.28	+0.55
737 - 846	+0.00	-0.05	-0.00	-0.00	+2.42	+1.52	+0.00	+0.19	-0.51
	-0.00	+0.19	+0.00	+0.00	-2.37	-1.32	+0.00	+0.11	+0.68
846 - 967	+0.00	-0.19	-0.00	-0.00	+2.81	+1.73	+0.00	+0.12	-0.59
	+0.00	+0.78	+0.00	+0.00	-3.33	-2.11	+0.00	+0.22	+0.73
967 - 1101	-0.00	-0.78	-0.00	-0.00	+2.41	+1.52	+0.00	-0.76	-0.94
	-0.00	+4.58	+0.00	+0.01	-2.79	-1.33	+0.00	+1.98	+1.48
1101 - 1248	+0.00	-4.58	-0.00	-0.01	+5.78	+3.24	+0.00	+0.14	-0.26
	-0.00	+19.35	+0.00	+0.02	-6.86	-5.49	+0.00	+0.41	+1.18
1248 - 1410	+0.00	-19.35	-0.00	-0.02	+5.85	+2.15	+0.00	-5.40	-3.24
	+0.00	+395.98	+0.00	+1.68	+27.71	+35.19	+0.00	+2.69	-5.18
1410 - 1588	-0.00	-395.98	-0.00	-1.68	-40.75	-3.72	+0.00	+33.56	+4.91
	-0.00	+496.83	+0.00	+3.64	-26.80	-31.74	+0.00	-0.32	+3.87
1588 - 1784	+0.00	-496.83	-0.00	-3.64	+36.07	+3.23	+0.00	-31.85	-1.54
	-0.00	+1257.78	+0.00	+0.00	-3.05	-3.79	+0.00	+0.94	+0.85
1784 - 2000	+0.00	-1257.78	-0.00	-0.00	+4.86	+1.31	+0.00	-3.96	-0.70
2000 - 2238	+0.00								



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$p_T$ range in GeV	PileUpDataMC [%]	PileUpPtBB [%]	PileUpPtEC1 [%]	PileUpPtEC2 [%]	PileUpPtHF [%]	PileUpPtRef [%]	RelativeBal [%]	RelativeFSR [%]	RelativeJEREC1 [%]
74 - 97	-0.58	+0.11	-0.84	+0.01	+0.00	-0.11	+1.74	+1.83	-1.55
	+1.52	+0.21	+0.57	+0.02	+0.00	+0.26	-0.60	-1.60	+1.48
97 - 133	-0.48	-0.04	-0.32	-0.00	+0.00	-0.20	+0.73	+0.98	-1.12
	+0.26	-0.09	+0.56	-0.01	+0.00	+0.16	-0.98	-0.85	+1.42
AK4 133 - 174	-0.36	+0.02	-0.28	+0.00	+0.00	-0.17	+0.89	+0.63	-1.14
	+0.52	+0.04	+0.22	+0.00	+0.00	+0.19	-0.57	-0.64	+1.17
AK7 174 - 220	-0.30	0.00	-0.10	-0.00	+0.00	-0.15	+0.48	+0.22	-1.22
	+0.21	-0.01	+0.08	-0.00	+0.00	+0.08	-0.65	-0.30	+1.06
220 - 272	-0.20	+0.00	+0.00	+0.00	+0.00	+0.10	+0.45	-0.00	-0.99
	+0.21	+0.00	-0.06	+0.00	+0.00	+0.14	-0.41	+0.08	+1.02
272 - 330	-0.17	-0.00	+0.04	-0.00	+0.00	-0.00	+0.36	-0.44	-1.04
	+0.16	-0.00	-0.05	-0.00	+0.00	-0.01	-0.33	+0.31	+1.00
330 - 395	-0.14	-0.00	+0.16	+0.00	+0.00	-0.06	+0.12	-0.70	-0.88
	+0.14	+0.00	-0.20	+0.00	+0.00	+0.07	-0.19	+0.83	+0.93
395 - 468	-0.13	-0.00	+0.21	-0.00	+0.00	+0.03	+0.03	-1.19	-1.01
	+0.10	+0.00	-0.20	-0.00	+0.00	-0.05	-0.05	+1.06	+0.90
468 - 548	-0.08	-0.00	+0.16	+0.00	+0.00	+0.09	-0.02	-1.47	-0.74
	+0.11	+0.00	-0.17	+0.00	+0.00	-0.06	+0.00	+1.49	+0.79
548 - 638	-0.07	-0.00	+0.21	+0.00	+0.00	+0.05	-0.15	-1.93	-0.96
	+0.05	+0.00	-0.19	-0.00	+0.00	-0.07	+0.25	+2.04	+1.03
638 - 737	-0.05	-0.00	+0.13	+0.00	+0.00	+0.07	-0.31	-2.58	-0.79
	+0.07	+0.00	-0.15	-0.00	+0.00	-0.05	+0.27	+2.53	+0.78
737 - 846	-0.11	-0.00	+0.10	+0.00	+0.00	+0.07	-0.33	-3.16	-0.82
	+0.09	+0.00	-0.08	-0.00	+0.00	-0.09	+0.35	+3.20	+0.78
846 - 967	-0.07	-0.00	-0.05	+0.00	+0.00	+0.13	-0.69	-3.98	-0.76
	+0.10	-0.00	-0.01	+0.00	+0.00	-0.12	+0.59	+3.97	+0.83
967 - 1101	-0.03	+0.00	-0.07	-0.00	+0.00	+0.08	-0.37	-4.20	-0.71
	+0.00	-0.00	+0.31	-0.00	+0.00	-0.05	+0.86	+4.93	+0.86
1101 - 1248	+0.01	+0.00	-0.73	-0.00	+0.00	-0.14	-1.43	-6.88	-0.77
	-0.01	-0.01	+0.36	-0.00	+0.00	+0.14	+0.82	+5.24	+0.65
1248 - 1410	+0.02	+0.06	+0.43	+0.00	+0.00	-0.05	-0.17	-4.80	-0.17
	-0.02	-0.04	+1.76	+0.00	+0.00	-0.36	+0.96	+12.16	+1.03
1410 - 1588	-0.00	+0.02	-5.67	+0.00	+0.00	-0.46	-2.29	-12.49	-3.03
	+0.02	+0.03	-0.42	-0.00	+0.00	+1.25	+2.66	+4.47	+0.68
1588 - 1784	+0.09	+0.38	+33.58	-0.00	+0.00	+1.90	+4.51	+52.06	+10.05
	-0.08	-0.31	+6.68	+0.00	+0.00	-3.66	-12.84	+5.27	-2.64
1784 - 2000	-0.05	+0.12	-32.27	-0.00	+0.00	-1.81	-1.25	-39.76	-6.38
	+0.04	-0.37	-3.86	-0.00	+0.00	+1.35	+6.75	+42.12	+2.31
2000 - 2238	+0.02	-0.33	-3.77	+0.00	+0.00	-0.44	-0.31	+6.24	-1.27
	-0.02	+0.04	-0.40	+0.00	+0.00	-0.04	+1.54	+5.50	+0.57



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$p_T$ range in GeV	RelativeJEREC2 [%]	RelativeJERHF [%]	RelativePtBB [%]	RelativePtEC1 [%]	RelativePtEC2 [%]	RelativePtHF [%]	RelativeSample [%]	RelativeStatEC [%]	RelativeStatFSR [%]
74 – 97	+0.08	+0.00	+0.21	+0.06	+0.01	+0.00	+1.80	-0.66	-0.13
	+0.22	+0.00	+0.14	+0.00	+0.00	+0.00	-0.72	+0.48	+0.22
97 – 133	-0.02	+0.00	-0.08	+0.00	+0.00	+0.00	+2.13	-0.48	-0.13
	-0.09	+0.00	-0.05	-0.03	+0.00	+0.00	-2.13	+0.66	+0.13
AK4 133 – 174	+0.02	+0.00	+0.04	-0.00	+0.00	+0.00	+1.74	-0.68	-0.17
	+0.03	+0.00	+0.02	+0.02	-0.00	+0.00	-1.49	+0.67	+0.17
AK7 174 – 220	+0.00	+0.00	+0.01	+0.05	-0.00	+0.00	+1.63	-0.88	-0.18
	-0.01	+0.00	-0.00	-0.06	-0.00	+0.00	-1.91	+0.75	+0.08
	+0.00	+0.00	+0.01	-0.04	+0.00	+0.00	+1.91	-0.81	-0.15
220 – 272	+0.00	+0.00	+0.00	+0.05	-0.00	+0.00	-1.82	+0.83	+0.17
	+0.00	+0.00	-0.00	-0.05	+0.00	+0.00	+1.83	-1.01	-0.16
272 – 330	-0.00	+0.00	-0.00	+0.06	+0.00	+0.00	-1.75	+0.93	+0.13
	+0.00	+0.00	+0.00	-0.06	+0.00	+0.00	+1.79	-0.95	-0.15
330 – 395	-0.00	+0.00	-0.00	+0.04	-0.00	+0.00	-1.91	+1.13	+0.16
	+0.00	+0.00	+0.00	-0.08	+0.00	+0.00	+2.04	-1.27	-0.21
395 – 468	-0.00	+0.00	-0.00	+0.07	-0.00	+0.00	-2.07	+1.13	+0.20
	+0.00	+0.00	+0.01	-0.09	+0.00	+0.00	+2.14	-1.19	-0.16
468 – 548	-0.00	+0.00	-0.01	+0.10	-0.00	+0.00	-2.11	+1.19	+0.18
	+0.00	+0.00	+0.01	-0.08	+0.00	+0.00	+2.43	-1.51	-0.24
548 – 638	-0.00	+0.00	-0.01	+0.09	-0.00	+0.00	-2.31	+1.70	+0.23
	+0.00	+0.00	+0.01	-0.09	+0.00	+0.00	+2.58	-1.59	-0.19
638 – 737	-0.00	+0.00	-0.01	+0.11	-0.00	+0.00	-2.56	+1.53	+0.22
	+0.00	+0.00	+0.02	-0.18	+0.00	+0.00	+2.96	-1.88	-0.29
737 – 846	-0.00	+0.00	-0.02	+0.15	-0.00	+0.00	-2.91	+1.85	+0.25
	-0.00	+0.00	+0.02	-0.11	-0.00	+0.00	+3.64	-2.11	-0.28
846 – 967	+0.00	+0.00	-0.02	+0.14	+0.00	+0.00	-3.46	+2.19	+0.23
	-0.00	+0.00	+0.03	-0.19	-0.00	+0.00	+4.31	-2.25	-0.17
967 – 1101	-0.00	+0.00	-0.03	+0.28	-0.00	+0.00	-4.10	+2.68	+0.40
	+0.00	+0.00	+0.04	-0.35	+0.00	+0.00	+5.47	-3.13	-0.51
1101 – 1248	+0.00	+0.00	-0.04	+0.19	+0.00	+0.00	-5.17	+2.15	+0.20
	+0.00	+0.00	+0.14	+0.08	+0.00	+0.00	+10.62	-3.01	+0.17
1248 – 1410	-0.00	+0.00	-0.16	+0.51	+0.00	+0.00	-6.72	+5.63	+0.44
	+0.00	+0.00	+0.08	-2.51	+0.00	+0.00	+3.70	-6.00	-1.99
1410 – 1588	-0.00	+0.00	-0.01	+0.55	-0.00	+0.00	-13.50	+5.80	+0.66
	-0.00	+0.00	+1.09	+8.40	-0.00	+0.00	+91.95	+29.86	+7.38
1588 – 1784	+0.00	+0.00	-0.95	-1.57	+0.00	+0.00	+39.83	-43.85	-2.20
	-0.00	+0.00	+0.14	-6.47	-0.00	+0.00	-56.87	-30.29	-6.94
1784 – 2000	-0.00	+0.00	-0.09	+0.68	+0.00	+0.00	-47.22	+40.78	+0.91
	+0.00	+0.00	+0.01	-1.55	+0.00	+0.00	-64.69	-3.87	-1.93
2000 – 2238	-0.00	+0.00	+0.40	+0.04	-0.00	+0.00	-85.84	+5.38	-0.06



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$p_T$ range in GeV	RelativeStatHF [%]	SinglePionECAL [%]	SinglePionHCAL [%]	TimePtEta [%]
74 – 97	+0.00	+1.05	+0.31	-2.30
	+0.00	-0.55	-0.13	+3.53
97 – 133	+0.00	+0.31	+0.09	-2.04
	+0.00	-0.40	-0.14	+1.83
133 – 174	+0.00	+0.39	+0.10	-2.24
	+0.00	-0.26	-0.10	+2.83
174 – 220	+0.00	+0.08	+0.05	-2.62
	+0.00	-0.16	-0.07	+2.09
220 – 272	+0.00	+0.08	-0.01	-2.50
	+0.00	-0.06	+0.00	+2.76
272 – 330	+0.00	-0.08	+0.04	-2.59
	+0.00	+0.07	-0.02	+2.52
330 – 395	+0.00	-0.07	-0.12	-2.68
	+0.00	+0.07	+0.10	+2.76
395 – 468	+0.00	-0.22	-0.06	-2.88
	+0.00	+0.17	+0.05	+2.88
468 – 548	+0.00	-0.13	-0.13	-3.04
	+0.00	+0.18	+0.15	+3.09
548 – 638	+0.00	-0.44	-0.24	-3.27
	+0.00	+0.42	+0.22	+3.33
638 – 737	+0.00	-0.30	-0.10	-3.39
	+0.00	+0.32	+0.14	+3.50
737 – 846	+0.00	-0.56	-0.35	-3.63
	+0.00	+0.54	+0.28	+3.69
846 – 967	+0.00	-0.53	-0.28	-4.04
	+0.00	+0.49	+0.29	+4.10
967 – 1101	+0.00	-0.63	-0.33	-3.88
	+0.00	+0.88	+0.52	+4.52
1101 – 1248	+0.00	-1.04	-0.71	-5.59
	+0.00	+0.67	+0.37	+4.24
1248 – 1410	+0.00	-0.16	-0.21	-4.26
	+0.00	+1.71	+0.97	+8.71
1410 – 1588	+0.00	-3.30	-2.36	-10.22
	+0.00	+0.63	+0.65	+8.11
1588 – 1784	+0.00	+5.18	+8.89	+48.37
	+0.00	-3.26	-2.67	-48.09
1784 – 2000	+0.00	-1.64	-6.73	-39.88
	+0.00	+2.21	+2.11	+57.81
2000 – 2238	+0.00	-0.35	-1.62	+0.32
	+0.00	+0.45	+0.61	+7.54



$$2.0 < |y| < 2.5$$

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	$p_T$ range in GeV	cross section in pb/GeV	tot. stat. unc. [%]	luminosity [%]	JER [%]	Model [%]	PU [%]	Pref [%]	fakeNoMatch [%]	fakeOutHigh [%]
	74 – 97	$1.9 \times 10^4$	$\pm 0.47$	$\pm 2.0$	-0.06 +0.99	-0.01 +0.01	-0.00 +0.01	-0.01 +0.01	+0.02 -0.02	+0.00 -0.00
	97 – 133	$5.1 \times 10^3$	$\pm 0.50$	$\pm 2.0$	+4.31 -5.21	+0.07 -0.07	+0.11 -0.13	+0.06 -0.06	+0.02 -0.02	-0.00 +0.00
	133 – 174	$1.1 \times 10^3$	$\pm 0.54$	$\pm 2.0$	+1.36 -1.88	+0.06 -0.06	-0.16 +0.17	+0.06 -0.06	+0.01 -0.01	+0.00 -0.00
	174 – 220	$2.7 \times 10^2$	$\pm 0.44$	$\pm 2.0$	+1.65 -2.15	+0.05 -0.05	-0.16 +0.17	+0.31 -0.31	+0.01 -0.01	-0.00 +0.00
	220 – 272	72	$\pm 0.59$	$\pm 2.0$	+1.96 -2.06	+0.05 -0.05	-0.26 +0.27	-0.01 +0.01	+0.01 -0.01	+0.00 -0.00
	272 – 330	21	$\pm 0.55$	$\pm 2.0$	+1.54 -2.05	+0.04 -0.04	-0.16 +0.17	+0.23 -0.23	+0.01 -0.01	-0.00 +0.00
	330 – 395	6.3	$\pm 0.42$	$\pm 2.0$	+1.46 -2.09	+0.04 -0.04	-0.31 +0.32	+0.17 -0.17	+0.01 -0.01	-0.00 +0.00
	395 – 468	1.8	$\pm 0.43$	$\pm 2.0$	+1.73 -2.16	+0.04 -0.04	-0.23 +0.24	+0.12 -0.11	+0.01 -0.01	-0.00 +0.00
	468 – 548	0.49	$\pm 0.57$	$\pm 2.0$	+1.41 -1.79	+0.03 -0.03	-0.31 +0.32	+0.13 -0.13	+0.01 -0.01	-0.00 +0.00
	548 – 638	0.13	$\pm 0.32$	$\pm 2.0$	+1.80 -1.98	+0.04 -0.04	-0.36 +0.37	+0.14 -0.13	+0.00 -0.00	+0.00 -0.00
	638 – 737	0.031	$\pm 0.51$	$\pm 2.0$	+2.11 -3.18	+0.04 -0.04	-0.46 +0.48	+0.13 -0.12	+0.00 -0.00	-0.00 +0.00
	737 – 846	0.0062	$\pm 1.06$	$\pm 2.0$	+3.04 -2.64	+0.04 -0.04	-0.17 +0.20	+0.13 -0.13	+0.00 -0.00	+0.00 -0.00
	846 – 967	0.0011	$\pm 2.39$	$\pm 2.0$	+3.40 -5.47	+0.05 -0.04	-0.42 +0.44	+0.15 -0.15	+0.00 -0.00	-0.00 +0.00
	967 – 1101	0.00013	$\pm 6.84$	$\pm 2.0$	+8.04 -7.06	+0.05 -0.05	-0.46 +0.42	+0.10 -0.10	-0.00 +0.00	+0.00 -0.00
	1101 – 1248	$1.6 \times 10^{-5}$	$\pm 18.93$	$\pm 2.0$	+1.37 -8.73	+0.03 -0.03	-0.40 +0.44	+0.10 -0.10	+0.00 -0.00	-0.00 +0.00
	1248 – 1410	0	$\pm 0.00$	$\pm 2.0$	+0.00 +0.00	+0.00 +0.00	+0.00 +0.00	+0.00 +0.00	+0.00 +0.00	+0.00 +0.00
	1410 – 1588	$6.7 \times 10^{-7}$	$\pm 108.82$	$\pm 2.0$	+44.01 +26.62	+0.32 -0.31	+13.31 -9.11	+0.27 -0.27	-0.00 +0.00	+0.00 -0.00



$$2.0 < |y| < 2.5$$

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$p_T$ range in GeV	fakeOutLow [%]	missNoMatch [%]	missOutHigh [%]	missOutLow [%]	AbsoluteMPFBias [%]	AbsoluteScale [%]	AbsoluteStat [%]	FlavorQCD [%]	Fragmentation [%]
74 - 97	+0.02	+0.00	+0.00	+0.00	-1.23	-0.83	+0.00	-4.40	-0.67
	-0.02	-0.00	-0.00	-0.00	+2.18	+1.29	+0.00	+7.65	+0.98
AK4	-0.01	+0.00	+0.00	+0.00	-1.28	-0.75	+0.00	-3.66	-0.24
AK7	+0.01	+0.00	+0.00	+0.00	+0.89	+0.54	+0.00	+3.03	+0.16
97 - 133	+0.00	+0.00	+0.00	+0.00	-1.21	-0.75	+0.00	-3.11	-0.26
133 - 174	-0.00	+0.00	+0.00	+0.00	+1.53	+0.92	+0.00	+3.66	+0.33
	-0.00	+0.00	+0.00	+0.00	-1.53	-0.99	+0.00	-3.00	-0.07
Summary & Conclusions	+0.00	-0.00	-0.00	-0.00	+0.85	+0.64	+0.00	+2.31	+0.07
	+0.00	+0.00	+0.00	+0.00	-1.16	-0.59	+0.00	-2.10	-0.07
Back-up	-0.00	-0.00	-0.00	-0.00	+1.69	+0.94	+0.00	+2.75	+0.06
220 - 272	-0.00	+0.00	+0.00	+0.00	-1.54	-1.01	+0.00	-2.30	+0.10
272 - 330	+0.00	-0.00	-0.00	-0.00	+1.37	+0.89	+0.00	+2.15	-0.10
	-0.00	+0.00	+0.00	+0.00	-1.72	-1.04	+0.00	-2.06	+0.12
330 - 395	+0.00	-0.00	-0.00	-0.00	+1.92	+1.12	+0.00	+2.33	-0.20
	-0.00	+0.00	+0.00	+0.00	-1.73	-0.99	+0.00	-1.67	+0.21
395 - 468	+0.00	-0.00	-0.00	-0.00	+1.78	+1.07	+0.00	+1.75	-0.13
	-0.00	+0.01	+0.00	+0.00	-2.23	-1.43	+0.00	-1.74	+0.35
468 - 548	+0.00	-0.01	-0.00	-0.00	+2.23	+1.31	+0.00	+1.60	-0.47
	-0.00	+0.04	+0.00	+0.00	-2.24	-1.28	+0.00	-1.32	+0.34
548 - 638	+0.00	-0.04	-0.00	-0.00	+2.00	+1.24	+0.00	+1.26	-0.36
	-0.00	+0.15	+0.00	+0.00	-2.74	-1.70	+0.00	-0.98	+0.66
638 - 737	+0.00	-0.15	-0.00	-0.00	+2.83	+1.81	+0.00	+1.13	-0.59
	-0.00	+0.63	+0.00	+0.00	-2.96	-1.88	+0.00	-0.73	+0.48
737 - 846	+0.00	-0.63	-0.00	-0.00	+3.11	+1.66	+0.00	+0.40	-0.63
	-0.00	+2.96	+0.00	+0.00	-4.45	-2.48	+0.00	+0.08	+1.23
846 - 967	+0.00	-2.96	-0.00	-0.00	+3.64	+2.56	+0.00	+0.56	-1.00
	+0.00	+19.93	+0.00	+0.09	-0.90	-1.98	+0.00	-0.78	-0.27
967 - 1101	-0.00	-19.93	-0.00	-0.09	+4.74	+1.87	+0.00	+1.21	-1.03
	-0.00	+157.41	+0.00	+0.00	-15.62	-5.22	+0.00	+3.81	+3.24
1101 - 1248	+0.00	-157.41	-0.00	-0.00	+6.99	+4.44	+0.00	-2.47	-4.94
	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
1248 - 1410	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	+0.00	+1233.24	+0.00	+0.00	+0.86	+0.65	+0.00	+0.57	-0.25
1410 - 1588	-0.00	-1233.24	-0.00	-0.00	-1.18	-0.76	+0.00	-0.63	+0.22



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$p_T$ range in GeV	PileUpDataMC [%]	PileUpPtBB [%]	PileUpPtEC1 [%]	PileUpPtEC2 [%]	PileUpPtHF [%]	PileUpPtRef [%]	RelativeBaI [%]	RelativeFSR [%]	RelativeJEREC1 [%]
74 - 97	-0.74	+0.10	-0.70	-0.19	+0.00	-0.15	+2.59	+1.89	-4.09
	+1.54	+0.21	+0.32	+0.10	+0.00	+0.27	-4.41	-1.52	+1.87
97 - 133	-0.59	-0.04	-0.17	+0.00	+0.00	+0.19	+3.18	+0.60	-2.48
	+0.26	-0.07	+0.34	+0.05	+0.00	+0.16	-2.18	-0.70	+3.58
133 - 174	-0.41	+0.02	-0.24	-0.01	+0.00	-0.17	+1.51	+0.41	-2.71
	+0.63	+0.03	+0.21	-0.01	+0.00	+0.25	-1.91	-0.24	+2.48
174 - 220	-0.32	-0.00	-0.13	-0.00	+0.00	-0.13	+0.80	-0.32	-2.73
	+0.18	-0.01	+0.03	-0.02	+0.00	+0.02	-0.98	-0.06	+2.03
220 - 272	-0.23	+0.00	-0.04	+0.01	+0.00	-0.10	+0.66	-0.42	-2.02
	+0.35	+0.00	+0.10	-0.00	+0.00	+0.16	-0.46	+0.70	+2.59
272 - 330	-0.19	+0.00	-0.05	+0.00	+0.00	-0.00	-0.44	-1.15	-2.40
	+0.12	-0.00	+0.03	-0.00	+0.00	-0.03	+0.29	+0.89	+2.41
330 - 395	-0.26	+0.00	+0.02	-0.01	+0.00	-0.02	-0.86	-1.54	-2.23
	+0.23	+0.00	-0.09	+0.01	+0.00	+0.05	+1.08	+1.73	+2.13
395 - 468	-0.09	+0.00	+0.09	+0.01	+0.00	+0.06	-1.91	-2.19	-2.29
	+0.17	-0.00	-0.03	+0.01	+0.00	-0.05	+1.84	+2.25	+2.44
468 - 548	-0.18	-0.00	+0.03	-0.04	+0.00	+0.04	-2.88	-2.99	-2.18
	+0.09	+0.00	-0.11	+0.01	+0.00	-0.09	+3.04	+2.99	+2.16
548 - 638	-0.13	+0.00	+0.18	-0.02	+0.00	+0.13	-3.74	-3.66	-2.14
	+0.15	-0.00	-0.14	+0.04	+0.00	-0.08	+3.34	+3.41	+1.99
638 - 737	-0.13	-0.00	+0.03	-0.04	+0.00	+0.07	-5.47	-4.83	-2.01
	+0.12	-0.00	-0.04	+0.01	+0.00	-0.09	+5.65	+5.02	+2.22
737 - 846	-0.10	-0.00	+0.28	-0.02	+0.00	+0.11	-6.54	-5.91	-1.89
	+0.08	+0.00	-0.35	+0.04	+0.00	-0.11	+7.02	+6.02	+1.76
846 - 967	-0.11	+0.00	+0.04	-0.01	+0.00	+0.17	-10.31	-8.72	-1.90
	+0.23	-0.00	+0.25	-0.02	+0.00	-0.15	+9.68	+7.99	+1.87
967 - 1101	-0.31	-0.00	-1.03	+0.01	+0.00	-0.13	-7.87	-6.71	-1.25
	-0.49	+0.00	-0.82	+0.01	+0.00	-0.07	+15.24	+14.94	+0.45
1101 - 1248	+0.14	+0.01	+0.69	-0.01	+0.00	+0.12	-31.97	-30.42	-4.84
	+1.53	-0.00	-0.85	-0.01	+0.00	+0.08	+18.80	+13.12	+3.87
1248 - 1410	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
1410 - 1588	+0.07	-0.00	-0.04	+0.02	+0.00	-0.03	+2.13	+1.83	+0.93
	-0.01	+0.00	+0.09	-0.01	+0.00	+0.03	+20.74	+18.62	-0.94





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$p_T$ range in GeV	RelativeJEREC2 [%]	RelativeJERHF [%]	RelativePtBB [%]	RelativePtEC1 [%]	RelativePtEC2 [%]	RelativePtHF [%]	RelativeSample [%]	RelativeStatEC [%]	RelativeStatFSR [%]
74 - 97	-1.59	+0.00	+0.21	+0.12	+0.04	+0.00	+0.32	-1.41	-0.35
	+0.47	+0.00	+0.13	-0.24	-0.07	+0.00	+2.56	+0.62	+0.26
97 - 133	-0.78	+0.00	-0.08	+0.07	+0.04	+0.00	-0.30	-1.07	-0.24
	+1.23	+0.00	-0.05	-0.01	-0.02	+0.00	-0.79	+1.25	+0.25
133 - 174	-0.81	+0.00	+0.03	+0.07	-0.01	+0.00	+1.24	-1.20	-0.25
	+0.72	+0.00	+0.02	-0.11	+0.00	+0.00	-0.53	+1.29	+0.32
174 - 220	-0.75	+0.00	-0.01	+0.02	-0.00	+0.00	+1.14	-1.53	-0.35
	+0.45	+0.00	-0.00	+0.01	-0.01	+0.00	-1.96	+0.94	+0.22
220 - 272	-0.59	+0.00	+0.00	-0.06	-0.01	+0.00	+2.37	-1.14	-0.20
	+0.80	+0.00	+0.00	+0.07	+0.02	+0.00	-1.79	+1.59	+0.31
272 - 330	-0.56	+0.00	-0.00	-0.12	-0.03	+0.00	+3.43	-1.85	-0.33
	+0.52	+0.00	+0.00	+0.11	+0.00	+0.00	-3.30	+1.78	+0.25
330 - 395	-0.46	+0.00	+0.00	-0.19	-0.04	+0.00	+3.63	-1.79	-0.42
	+0.70	+0.00	-0.00	+0.13	+0.09	+0.00	-3.83	+1.80	+0.43
395 - 468	-0.39	+0.00	-0.00	-0.19	-0.01	+0.00	+5.83	-2.19	-0.27
	+0.37	+0.00	+0.00	+0.27	+0.00	+0.00	-5.20	+2.27	+0.34
468 - 548	-0.32	+0.00	+0.00	-0.41	-0.05	+0.00	+6.86	-2.82	-0.51
	+0.31	+0.00	-0.00	+0.28	+0.04	+0.00	-7.11	+2.89	+0.40
548 - 638	-0.23	+0.00	+0.00	-0.41	-0.03	+0.00	+8.71	-2.98	-0.44
	+0.28	+0.00	+0.00	+0.40	+0.04	+0.00	-8.34	+2.74	+0.41
638 - 737	-0.16	+0.00	-0.00	-0.55	-0.04	+0.00	+12.41	-4.04	-0.54
	+0.08	+0.00	+0.00	+0.63	+0.02	+0.00	-11.47	+4.18	+0.59
737 - 846	-0.07	+0.00	+0.00	-0.85	-0.02	+0.00	+15.99	-4.67	-0.56
	+0.14	+0.00	+0.00	+0.67	+0.04	+0.00	-13.72	+4.69	+0.46
846 - 967	+0.01	+0.00	+0.00	-1.14	-0.01	+0.00	+20.63	-6.85	-0.71
	-0.03	+0.00	+0.00	+1.31	-0.01	+0.00	-19.66	+6.02	+0.96
967 - 1101	-0.03	+0.00	-0.00	-1.10	-0.01	+0.00	+34.12	-2.56	-1.37
	+0.02	+0.00	+0.01	-0.01	+0.01	+0.00	-21.16	+10.09	-0.54
1101 - 1248	+0.02	+0.00	-0.01	-4.88	+0.01	+0.00	+43.85	-27.61	-2.56
	-0.02	+0.00	+0.02	+4.18	-0.01	+0.00	-32.90	+7.73	+3.55
1248 - 1410	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
1410 - 1588	+0.07	+0.00	-0.02	+0.26	+0.02	+0.00	+19.94	+1.34	+0.27
	-0.04	+0.00	-0.01	-0.20	-0.01	+0.00	-45.65	+31.65	-0.19



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$p_T$ range in GeV	RelativeStatHF [%]	SinglePionECAL [%]	SinglePionHCAL [%]	TimePtEta [%]
74 - 97	+0.00	+1.09	+0.34	-1.39
	+0.00	-0.69	-0.18	+3.24
97 - 133	+0.00	+0.30	+0.06	-1.90
	+0.00	-0.40	-0.10	+1.30
133 - 174	+0.00	+0.37	+0.17	-1.95
	+0.00	-0.28	-0.15	+2.39
174 - 220	+0.00	+0.08	+0.02	-2.58
	+0.00	-0.11	-0.02	+1.80
220 - 272	+0.00	+0.06	+0.03	-2.17
	+0.00	-0.06	-0.01	+2.85
272 - 330	+0.00	-0.09	-0.03	-3.08
	+0.00	+0.10	+0.01	+2.97
330 - 395	+0.00	-0.20	-0.14	-3.12
	+0.00	+0.12	+0.12	+3.01
395 - 468	+0.00	-0.14	-0.04	-3.54
	+0.00	+0.23	+0.11	+3.88
468 - 548	+0.00	-0.41	-0.24	-4.03
	+0.00	+0.27	+0.17	+4.09
548 - 638	+0.00	-0.50	-0.26	-4.18
	+0.00	+0.47	+0.28	+3.86
638 - 737	+0.00	-0.53	-0.25	-5.03
	+0.00	+0.61	+0.25	+5.34
737 - 846	+0.00	-0.81	-0.48	-5.31
	+0.00	+0.66	+0.37	+5.35
846 - 967	+0.00	-0.94	-0.46	-7.35
	+0.00	+1.17	+0.78	+6.71
967 - 1101	+0.00	-1.09	-1.39	-2.83
	+0.00	-0.36	-0.61	+9.18
1101 - 1248	+0.00	-4.88	-2.55	-23.81
	+0.00	+4.33	+3.60	+8.12
1248 - 1410	+0.00	+0.00	+0.00	+0.00
	+0.00	+0.00	+0.00	+0.00
1410 - 1588	+0.00	+0.19	+0.14	+1.87
	+0.00	-0.18	-0.03	+32.06



$|y| < 0.5$

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$p_T$ range in GeV	cross section in pb/GeV	tot. stat. unc. [%]	luminosity [%]	JER [%]	Model [%]	PU [%]	Pref [%]	fakeNoMatch [%]	fakeOutHigh [%]
74 – 97	$5.8 \times 10^4$	$\pm 0.54$	$\pm 2.0$	+0.68 -0.26	-0.00 +0.00	-0.01 +0.01	+0.01 -0.01	+0.04 -0.04	+0.00 +0.00
97 – 133	$1.4 \times 10^4$	$\pm 0.36$	$\pm 2.0$	+2.01 -2.21	+0.08 -0.08	+0.34 -0.35	-0.01 +0.00	+0.03 -0.03	+0.00 +0.00
133 – 174	$3.2 \times 10^3$	$\pm 0.50$	$\pm 2.0$	+1.12 -1.30	+0.06 -0.06	+0.07 -0.08	-0.00 +0.00	+0.01 -0.01	+0.00 +0.00
174 – 220	$8.4 \times 10^2$	$\pm 0.36$	$\pm 2.0$	+1.10 -1.12	+0.05 -0.05	+0.13 -0.13	-0.01 +0.00	+0.01 -0.01	+0.00 +0.00
220 – 272	$2.5 \times 10^2$	$\pm 0.42$	$\pm 2.0$	+0.79 -0.93	+0.04 -0.04	-0.08 +0.07	-0.01 +0.01	+0.01 -0.01	+0.00 +0.00
272 – 330	83	$\pm 0.28$	$\pm 2.0$	+0.54 -0.72	+0.03 -0.03	+0.08 -0.09	-0.00 +0.00	+0.01 -0.01	+0.00 +0.00
330 – 395	29	$\pm 0.19$	$\pm 2.0$	+0.72 -0.70	+0.03 -0.03	-0.05 +0.04	-0.01 +0.01	+0.01 -0.01	+0.00 +0.00
395 – 468	11	$\pm 0.17$	$\pm 2.0$	+0.43 -0.50	+0.03 -0.03	+0.02 +0.02	-0.01 +0.01	+0.00 -0.00	+0.00 +0.00
468 – 548	4.1	$\pm 0.16$	$\pm 2.0$	+0.53 -0.50	+0.02 -0.02	-0.01 +0.01	-0.01 +0.01	+0.00 -0.00	+0.00 +0.00
548 – 638	1.6	$\pm 0.10$	$\pm 2.0$	+0.40 -0.42	+0.02 -0.02	-0.02 +0.03	-0.01 +0.01	+0.00 -0.00	+0.00 +0.00
638 – 737	0.66	$\pm 0.12$	$\pm 2.0$	+0.36 -0.46	+0.02 -0.02	+0.03 -0.03	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
737 – 846	0.27	$\pm 0.18$	$\pm 2.0$	+0.38 -0.33	+0.02 -0.02	+0.02 +0.03	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
846 – 967	0.11	$\pm 0.26$	$\pm 2.0$	+0.40 -0.42	+0.02 -0.02	-0.02 +0.02	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
967 – 1101	0.047	$\pm 0.38$	$\pm 2.0$	+0.43 -0.45	+0.02 -0.02	-0.08 +0.07	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
1101 – 1248	0.019	$\pm 0.57$	$\pm 2.0$	+0.38 -0.46	+0.02 -0.02	-0.05 +0.05	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
1248 – 1410	0.0079	$\pm 0.84$	$\pm 2.0$	+0.53 -0.54	+0.02 -0.02	-0.02 +0.01	+0.00 -0.00	+0.00 -0.00	+0.00 +0.00
1410 – 1588	0.0033	$\pm 1.25$	$\pm 2.0$	+0.45 -0.45	+0.02 -0.02	-0.03 +0.03	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
1588 – 1784	0.0012	$\pm 1.95$	$\pm 2.0$	+0.72 -0.84	+0.02 -0.02	-0.01 +0.01	+0.00 -0.00	+0.00 -0.00	+0.00 +0.00
1784 – 2000	0.00047	$\pm 3.05$	$\pm 2.0$	+0.60 -0.60	+0.02 -0.02	-0.06 +0.06	+0.00 -0.00	+0.00 -0.00	+0.00 +0.00
2000 – 2238	0.00018	$\pm 4.58$	$\pm 2.0$	+0.74 0.75	+0.02 0.02	-0.03 -0.03	+0.00 0.00	+0.00 0.00	+0.00 0.00



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$p_T$ range in GeV	fakeOutLow [%]	missNoMatch [%]	missOutHigh [%]	missOutLow [%]	AbsoluteMPFBias [%]	AbsoluteScale [%]	AbsoluteStat [%]	FlavorQCD [%]	Fragmentation [%]
74 - 97	+0.04	+0.00	+0.00	+0.00	-1.32	-0.79	+0.00	-3.82	-0.43
	-0.04	-0.00	-0.00	-0.00	+2.00	+1.18	+0.00	+7.24	+0.72
97 - 133	-0.01	+0.00	+0.00	+0.00	+1.16	-0.71	+0.00	-3.22	-0.19
	+0.01	-0.00	-0.00	-0.00	+1.09	+0.66	+0.00	+2.87	+0.12
AK4	+0.01	+0.00	+0.00	+0.00	+1.27	-0.81	+0.00	-2.83	-0.19
AK7	133 - 174	-0.01	-0.00	-0.00	+1.27	+0.72	+0.00	+3.14	+0.21
	174 - 220	-0.00	+0.00	+0.00	-1.18	-0.74	+0.00	-2.37	-0.09
	220 - 272	+0.00	-0.00	-0.00	+1.34	+0.84	+0.00	+2.29	+0.11
	272 - 330	+0.00	+0.00	+0.00	-1.34	-0.80	+0.00	-2.17	+0.03
	330 - 395	-0.00	-0.00	-0.00	+1.08	+0.68	+0.00	+2.10	-0.04
	395 - 468	-0.00	+0.00	+0.00	-1.23	-0.76	+0.00	-1.78	+0.02
	468 - 548	+0.00	-0.00	-0.00	+1.26	+0.74	+0.00	+1.79	-0.04
	548 - 638	-0.00	+0.00	+0.00	-1.34	-0.80	+0.00	-1.65	+0.11
	638 - 737	+0.00	-0.00	-0.00	+1.40	+0.85	+0.00	+1.77	-0.11
	737 - 846	-0.00	+0.00	+0.00	-1.33	-0.80	+0.00	-1.34	+0.13
	846 - 967	+0.00	-0.00	-0.00	+1.35	+0.83	+0.00	+1.34	-0.13
	967 - 1101	-0.00	+0.00	+0.00	-1.42	-0.87	+0.00	-1.20	+0.26
	1101 - 1248	+0.00	-0.00	-0.00	+1.38	+0.82	+0.00	+1.18	-0.30
	1248 - 1410	-0.00	+0.00	+0.00	-1.35	-0.83	+0.00	-0.99	+0.18
	1410 - 1588	+0.00	-0.00	-0.00	+1.46	+0.88	+0.00	+0.99	-0.15
	1588 - 1784	-0.00	+0.00	+0.00	-1.52	-0.91	+0.00	-0.71	+0.31
	1784 - 2000	+0.00	-0.00	-0.00	+1.51	+0.92	+0.00	+0.71	-0.34
	2000 - 2238	-0.00	+0.01	+0.00	-1.46	-0.88	+0.00	-0.51	+0.28
		+0.00	-0.01	-0.00	+1.46	+0.87	+0.00	+0.52	-0.24
		-0.00	+0.02	+0.00	-1.59	-1.02	+0.00	-0.26	+0.37
		+0.00	-0.02	-0.00	+1.61	+1.01	+0.00	+0.24	-0.43
		-0.00	+0.05	+0.00	-1.59	-0.92	+0.00	-0.11	+0.37
		+0.00	-0.05	-0.00	+1.60	+0.94	+0.00	+0.15	-0.30
		-0.00	+0.12	+0.00	-1.80	-1.06	+0.00	+0.09	+0.40
		+0.00	-0.12	-0.00	+1.59	+1.00	+0.00	-0.15	-0.52
		-0.00	+0.28	+0.00	-1.53	-1.03	+0.00	+0.47	+0.57
		+0.00	-0.28	-0.00	+2.00	+1.13	+0.00	-0.34	-0.38
		-0.00	+0.69	+0.00	-2.26	-1.30	+0.00	+0.59	+0.58
		+0.00	-0.69	-0.00	+1.68	+1.35	+0.00	-0.73	-0.77
		-0.00	+1.72	+0.00	-1.55	-1.04	+0.00	+0.83	+0.50
		+0.00	-1.72	-0.00	+2.62	+1.07	+0.00	-0.83	-0.50
		-0.00	+4.29	+0.00	-2.64	-1.43	+0.00	+0.80	+0.50
		+0.00	-1.72	-0.00	+1.28	+0.80	+0.00	-1.08	-0.60
		-0.00	+4.29	+0.00	-0.98	-0.59	+0.00	+2.00	+1.50
		+0.00	-4.29	-0.00	+3.11	+2.48	+0.00	-1.04	-0.77
		-0.00	+11.93	+0.00	-4.47	-2.63	+0.00	+2.35	+1.12



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$p_T$ range in GeV	PileUpDataMC [%]	PileUpPtBB [%]	PileUpPtEC1 [%]	PileUpPtEC2 [%]	PileUpPtHF [%]	PileUpPtRef [%]	RelativeBal [%]	RelativeFSR [%]	RelativeJEREC1 [%]
74 – 97	-1.00	+0.00	+0.18	+0.01	+0.00	-0.28	-0.31	+1.71	+0.29
	+1.39	+0.12	+0.21	+0.01	+0.00	+0.41	+1.11	-1.88	+0.73
97 – 133	-0.64	-0.05	-0.04	-0.00	+0.00	-0.14	-0.84	+1.25	-0.07
	+0.61	+0.04	-0.05	-0.00	+0.00	+0.10	+0.74	-1.10	-0.17
133 – 174	-0.61	-0.15	+0.02	+0.00	+0.00	-0.17	-0.83	+0.90	+0.03
	+0.51	+0.16	+0.03	+0.00	+0.00	+0.18	+0.74	-1.11	+0.09
AK4	-0.33	-0.11	-0.00	-0.00	+0.00	-0.09	-0.79	+0.96	-0.01
AK7	+0.44	+0.13	-0.00	-0.00	+0.00	+0.09	+0.94	-0.75	-0.02
220 – 272	-0.29	-0.09	+0.00	-0.00	+0.00	-0.07	-0.93	+0.49	+0.00
	+0.32	+0.09	+0.00	+0.00	+0.00	+0.06	+0.78	-0.55	+0.00
272 – 330	-0.33	-0.11	-0.00	+0.00	+0.00	+0.03	-0.89	+0.39	-0.00
	+0.27	+0.09	-0.00	+0.00	+0.00	-0.04	+0.82	-0.46	+0.00
330 – 395	-0.15	-0.07	+0.00	+0.00	+0.00	-0.06	-0.92	+0.26	+0.00
	+0.16	+0.07	+0.00	+0.00	+0.00	+0.06	+0.98	-0.22	+0.00
395 – 468	-0.25	-0.08	-0.00	+0.00	+0.00	+0.05	-0.99	+0.04	+0.00
	+0.25	+0.08	-0.00	-0.00	+0.00	-0.06	+1.01	-0.04	-0.00
468 – 548	-0.15	-0.00	-0.00	+0.00	+0.00	+0.04	-1.02	-0.17	-0.00
	+0.13	-0.00	+0.00	+0.00	+0.00	-0.05	+0.96	+0.13	+0.00
548 – 638	-0.19	-0.07	+0.00	+0.00	+0.00	+0.04	-1.02	-0.25	-0.00
	+0.20	+0.07	+0.00	+0.00	+0.00	-0.05	+1.10	+0.26	+0.00
638 – 737	-0.11	+0.05	+0.00	+0.00	+0.00	+0.05	-1.13	-0.53	+0.00
	+0.11	-0.05	+0.00	+0.00	+0.00	-0.05	+1.12	+0.53	-0.00
737 – 846	-0.10	+0.04	+0.00	-0.00	+0.00	+0.05	-1.05	-0.65	-0.00
	+0.11	-0.04	-0.00	+0.00	+0.00	-0.05	+1.05	+0.66	+0.00
846 – 967	-0.16	+0.04	+0.00	+0.00	+0.00	+0.09	-1.22	-0.92	+0.00
	+0.15	-0.05	+0.00	+0.00	+0.00	-0.10	+1.24	+0.90	+0.00
967 – 1101	-0.08	+0.12	-0.00	-0.00	+0.00	+0.10	-1.18	-1.00	-0.00
	+0.09	-0.09	-0.00	+0.00	+0.00	-0.10	+1.16	+1.02	-0.00
1101 – 1248	-0.06	+0.10	+0.00	+0.00	+0.00	-0.07	-1.32	-1.45	+0.00
	+0.07	-0.11	+0.00	-0.00	+0.00	+0.11	+1.25	+1.26	+0.00
1248 – 1410	+0.01	+0.15	+0.00	+0.00	+0.00	+0.01	-1.31	-1.27	+0.00
	+0.00	-0.08	-0.00	+0.00	+0.00	-0.01	+1.47	+1.77	+0.00
1410 – 1588	-0.23	+0.22	+0.00	+0.00	+0.00	-0.23	-1.51	-2.43	+0.01
	+0.09	-0.39	+0.00	-0.00	+0.00	+0.10	+1.55	+1.61	+0.00
1588 – 1784	+0.10	+0.08	-0.00	+0.00	+0.00	+0.11	-1.52	-1.40	-0.00
	+0.08	-0.03	-0.01	+0.00	+0.00	+0.08	+1.57	+2.86	-0.00
1784 – 2000	-0.31	+0.41	-0.00	+0.00	+0.00	-0.34	-1.61	-3.21	+0.00
	+0.17	-0.46	+0.00	-0.00	+0.00	+0.17	+1.24	+1.22	-0.00
2000 – 2238	+0.28	+0.33	-0.00	+0.00	+0.00	+0.37	-1.56	-1.10	-0.00
	-0.15	+0.07	+0.00	+0.00	+0.00	-0.16	+2.90	+3.12	+0.00
2238 – 2500	-0.64	+0.05	+0.00	-0.00	+0.00	-0.94	-3.07	-7.01	+0.00
	+0.32	-0.03	-0.00	-0.00	-0.00	-0.39	-0.70	-5.53	-0.00



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$p_T$ range in GeV	RelativeJEREC2 [%]	RelativeJERHF [%]	RelativePtBB [%]	RelativePtEC1 [%]	RelativePtEC2 [%]	RelativePtHF [%]	RelativeSample [%]	RelativeStatEC [%]	RelativeStatFSR [%]
74 – 97	+0.09	+0.00	+0.29	+0.02	+0.00	+0.00	-1.11	+0.12	-0.12
	+0.20	+0.00	-0.35	+0.02	+0.00	+0.00	+2.57	+0.25	+0.18
97 – 133	-0.02	+0.00	+0.11	-0.00	-0.00	+0.00	-1.41	-0.03	-0.06
	-0.04	+0.00	-0.06	-0.00	-0.00	+0.00	+1.16	-0.06	+0.08
133 – 174	+0.01	+0.00	+0.01	+0.00	+0.00	+0.00	-1.12	+0.01	-0.12
	+0.02	+0.00	-0.06	+0.00	+0.00	+0.00	+1.22	+0.03	+0.07
174 – 220	-0.00	+0.00	+0.01	+0.00	+0.00	+0.00	-0.98	-0.00	-0.06
	-0.00	+0.00	+0.00	-0.00	-0.00	+0.00	+1.03	-0.01	+0.09
220 – 272	+0.00	+0.00	-0.14	+0.00	+0.00	+0.00	-0.86	+0.00	-0.08
	+0.01	+0.00	+0.16	-0.00	+0.00	+0.00	+0.87	+0.00	+0.08
272 – 330	-0.00	+0.00	-0.11	-0.00	+0.00	+0.00	-0.68	-0.00	+0.09
	-0.00	+0.00	+0.11	+0.00	+0.00	+0.00	+0.63	-0.00	+0.07
330 – 395	+0.00	+0.00	-0.27	+0.00	+0.00	+0.00	-0.55	+0.00	-0.09
	+0.00	+0.00	+0.26	-0.00	-0.00	+0.00	+0.61	+0.00	+0.09
395 – 468	+0.00	+0.00	-0.23	-0.00	+0.00	+0.00	-0.48	-0.00	-0.10
	-0.00	+0.00	+0.26	-0.00	-0.00	+0.00	+0.45	-0.00	+0.10
468 – 548	+0.00	+0.00	-0.45	+0.00	+0.00	+0.00	-0.38	-0.00	-0.10
	+0.00	+0.00	+0.39	-0.00	+0.00	+0.00	+0.37	+0.00	+0.08
548 – 638	+0.00	+0.00	-0.37	-0.00	-0.00	+0.00	-0.21	-0.00	-0.10
	+0.00	+0.00	+0.41	+0.00	+0.00	+0.00	+0.22	+0.00	+0.10
638 – 737	+0.00	+0.00	-0.53	+0.00	+0.00	+0.00	-0.13	+0.00	-0.10
	+0.00	+0.00	+0.51	+0.00	+0.00	+0.00	+0.13	-0.00	+0.10
737 – 846	+0.00	+0.00	-0.49	+0.00	-0.00	+0.00	-0.04	-0.00	-0.11
	+0.00	+0.00	+0.52	-0.00	+0.00	+0.00	+0.06	+0.00	+0.12
846 – 967	+0.00	+0.00	-0.67	-0.00	+0.00	+0.00	+0.12	+0.00	-0.10
	+0.00	+0.00	+0.64	+0.00	-0.00	+0.00	-0.12	+0.00	+0.10
967 – 1101	+0.00	+0.00	-0.62	-0.00	+0.00	+0.00	+0.16	-0.00	-0.12
	+0.00	+0.00	+0.63	-0.00	+0.00	+0.00	-0.18	-0.00	+0.13
1101 – 1248	+0.00	+0.00	-0.76	+0.00	-0.00	+0.00	+0.27	+0.00	-0.14
	+0.00	+0.00	+0.75	+0.00	+0.00	+0.00	-0.34	+0.00	+0.14
1248 – 1410	+0.00	+0.00	-0.78	+0.00	+0.00	+0.00	+0.52	+0.00	-0.02
	+0.00	+0.00	+0.91	+0.00	+0.00	+0.00	-0.32	-0.00	+0.05
1410 – 1588	+0.00	+0.00	-1.20	+0.00	+0.00	+0.00	+0.67	+0.00	-0.36
	+0.00	+0.00	+1.00	+0.00	-0.00	+0.00	-0.82	+0.01	+0.24
1588 – 1784	+0.00	+0.00	-0.78	-0.00	+0.00	+0.00	+0.57	-0.00	+0.08
	+0.00	+0.00	+0.97	-0.00	+0.00	+0.00	-0.69	-0.01	+0.04
1784 – 2000	+0.00	+0.00	-1.31	+0.00	+0.00	+0.00	+0.88	+0.00	-0.37
	+0.00	+0.00	+1.04	-0.00	-0.00	+0.00	-0.93	+0.00	+0.24
2000 – 2238	+0.00	+0.00	+0.04	-0.00	+0.00	+0.00	+1.24	-0.00	+0.15
	+0.00	+0.00	+1.64	-0.00	-0.00	+0.00	-0.20	+0.00	+0.02
2238 – 2500	+0.00	+0.00	-4.02	+0.00	+0.00	+0.00	+1.50	+0.00	-0.73



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$p_T$ range in GeV	RelativeStatHF [%]	SinglePionECAL [%]	SinglePionHCAL [%]	TimePtEta [%]
74 - 97	+0.00	+0.89	+0.25	-1.25
	+0.00	-0.52	-0.20	+2.99
97 - 133	+0.00	+0.22	+0.10	-1.59
	+0.00	-0.32	-0.06	+1.29
133 - 174	+0.00	+0.20	+0.07	-1.71
	+0.00	-0.17	-0.11	+1.86
174 - 220	+0.00	+0.12	+0.00	-1.88
	+0.00	-0.10	+0.01	+1.86
220 - 272	+0.00	-0.04	-0.01	-2.09
	+0.00	+0.03	-0.01	+1.88
272 - 330	+0.00	-0.05	+0.00	-2.05
	+0.00	+0.03	-0.02	+2.12
330 - 395	+0.00	-0.10	-0.10	-2.25
	+0.00	+0.10	+0.11	+2.36
395 - 468	+0.00	-0.15	-0.04	-2.32
	+0.00	+0.15	+0.04	+2.34
468 - 548	+0.00	-0.20	-0.15	-2.42
	+0.00	+0.17	+0.13	+2.50
548 - 638	+0.00	-0.30	-0.16	-2.46
	+0.00	+0.34	+0.18	+2.51
638 - 737	+0.00	-0.27	-0.09	-2.68
	+0.00	+0.24	+0.08	+2.71
737 - 846	+0.00	-0.35	-0.21	-2.65
	+0.00	+0.38	+0.23	+2.69
846 - 967	+0.00	-0.41	-0.19	-2.82
	+0.00	+0.34	+0.17	+2.99
967 - 1101	+0.00	-0.36	-0.24	-2.93
	+0.00	+0.44	+0.26	+2.84
1101 - 1248	+0.00	-0.56	-0.34	-3.29
	+0.00	+0.44	+0.33	+3.03
1248 - 1410	+0.00	-0.42	-0.18	-3.05
	+0.00	+0.60	+0.32	+3.89
1410 - 1588	+0.00	-0.70	-0.52	-4.09
	+0.00	+0.51	+0.34	+3.11
1588 - 1784	+0.00	-0.41	-0.44	-2.56
	+0.00	+0.44	+0.29	+5.01
1784 - 2000	+0.00	-0.72	-0.29	-4.60
	+0.00	+0.66	+0.43	+1.58
2000 - 2238	+0.00	-0.70	-0.46	-1.82
	+0.00	+1.25	+0.96	+4.33
2238 - 2500	+0.00	-0.78	-0.88	-7.54



$$0.5 < |y| < 1.0$$

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$p_T$ range in GeV	cross section in pb/GeV	tot. stat. unc. [%]	luminosity [%]	JER [%]	Model [%]	PU [%]	Pref [%]	fakeNoMatch [%]	fakeOutHigh [%]
74 – 97	$5.7 \times 10^4$	$\pm 0.55$	$\pm 2.0$	+0.72 -0.26	-0.00 +0.00	+0.03 -0.04	+0.01 -0.01	+0.04 -0.04	+0.00 -0.00
97 – 133	$1.4 \times 10^4$	$\pm 0.38$	$\pm 2.0$	+2.14 -2.32	+0.08 -0.08	+0.30 -0.30	-0.01 +0.01	+0.03 -0.03	+0.00 -0.00
133 – 174	$3.1 \times 10^3$	$\pm 0.53$	$\pm 2.0$	+1.06 -1.18	+0.06 -0.06	+0.07 -0.09	-0.00 +0.00	+0.01 -0.01	+0.00 -0.00
174 – 220	$7.9 \times 10^2$	$\pm 0.39$	$\pm 2.0$	+1.18 -1.33	+0.05 -0.05	+0.09 -0.09	-0.01 +0.01	+0.01 -0.01	+0.00 -0.00
220 – 272	$2.3 \times 10^2$	$\pm 0.45$	$\pm 2.0$	+0.79 -0.77	+0.04 -0.04	-0.00 -0.01	-0.01 +0.01	+0.01 -0.01	+0.00 -0.00
272 – 330	76	$\pm 0.30$	$\pm 2.0$	+0.72 -0.85	+0.04 -0.04	+0.01 -0.01	-0.01 +0.01	+0.01 -0.01	-0.00 +0.00
330 – 395	26	$\pm 0.21$	$\pm 2.0$	+0.66 -0.67	+0.03 -0.03	-0.04 +0.04	-0.01 +0.01	+0.01 -0.01	+0.00 -0.00
395 – 468	9.8	$\pm 0.18$	$\pm 2.0$	+0.45 -0.46	+0.03 -0.03	+0.01 +0.00	-0.01 +0.01	+0.01 -0.01	-0.00 +0.00
468 – 548	3.6	$\pm 0.18$	$\pm 2.0$	+0.52 -0.57	+0.03 -0.03	-0.06 +0.06	-0.01 +0.01	+0.00 -0.00	+0.00 -0.00
548 – 638	1.4	$\pm 0.11$	$\pm 2.0$	+0.40 -0.49	+0.03 -0.03	-0.04 +0.03	-0.01 +0.01	+0.00 -0.00	+0.00 -0.00
638 – 737	0.57	$\pm 0.14$	$\pm 2.0$	+0.48 -0.41	+0.02 -0.02	-0.05 +0.05	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
737 – 846	0.23	$\pm 0.20$	$\pm 2.0$	+0.44 -0.55	+0.02 -0.02	-0.04 +0.03	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
846 – 967	0.094	$\pm 0.30$	$\pm 2.0$	+0.43 -0.41	+0.02 -0.02	-0.05 +0.05	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
967 – 1101	0.038	$\pm 0.45$	$\pm 2.0$	+0.55 -0.57	+0.02 -0.02	-0.01 +0.02	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
1101 – 1248	0.015	$\pm 0.67$	$\pm 2.0$	+0.43 -0.52	+0.02 -0.02	-0.09 +0.09	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
1248 – 1410	0.0059	$\pm 1.03$	$\pm 2.0$	+0.66 -0.70	+0.02 -0.02	-0.03 +0.03	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
1410 – 1588	0.0023	$\pm 1.59$	$\pm 2.0$	+0.66 -0.73	+0.02 -0.02	-0.09 +0.08	+0.00 -0.00	+0.00 -0.00	+0.00 -0.00
1588 – 1784	0.00085	$\pm 2.44$	$\pm 2.0$	+0.73 -0.68	+0.02 -0.02	-0.01 +0.01	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00
1784 – 2000	0.00028	$\pm 4.08$	$\pm 2.0$	+1.06 -1.17	+0.02 -0.02	-0.08 +0.08	+0.00 -0.00	+0.00 -0.00	+0.00 -0.00
2000 – 2238	$9.8 \times 10^{-5}$	$\pm 6.47$	$\pm 2.0$	+0.74 -0.77	+0.02 -0.02	-0.01 +0.01	-0.00 +0.00	+0.00 -0.00	-0.00 +0.00





$$0.5 < |y| < 1.0$$

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$p_T$ range in GeV	fakeOutLow [%]	missNoMatch [%]	missOutHigh [%]	missOutLow [%]	AbsoluteMPFBias [%]	AbsoluteScale [%]	AbsoluteStat [%]	FlavorQCD [%]	Fragmentation [%]
74 - 97	+0.04	+0.00	+0.00	+0.00	-1.32	-0.79	+0.00	-3.87	-0.34
	-0.04	-0.00	-0.00	-0.00	+2.17	+1.27	+0.00	+7.45	+0.67
97 - 133	-0.01	+0.00	+0.00	+0.00	-1.21	-0.75	+0.00	-3.30	-0.25
	+0.01	-0.00	-0.00	-0.00	+1.13	+0.73	+0.00	+2.91	+0.21
133 - 174	+0.01	+0.00	+0.00	+0.00	-1.08	-0.69	+0.00	-2.72	-0.16
	-0.01	-0.00	-0.00	-0.00	+1.20	+0.73	+0.00	+3.09	+0.19
174 - 220	-0.00	+0.00	+0.00	+0.00	-1.54	-0.92	+0.00	-2.68	-0.14
	+0.00	-0.00	-0.00	-0.00	+1.32	+0.82	+0.00	+2.59	+0.08
220 - 272	+0.00	+0.00	+0.00	+0.00	-0.91	-0.56	+0.00	-1.88	+0.09
	-0.00	-0.00	-0.00	-0.00	+1.28	+0.75	+0.00	+2.19	-0.04
272 - 330	-0.00	+0.00	+0.00	+0.00	-1.49	-0.90	+0.00	-2.01	+0.03
	+0.00	-0.00	-0.00	-0.00	+1.32	+0.74	+0.00	+1.88	-0.06
330 - 395	-0.00	+0.00	+0.00	+0.00	-1.27	-0.79	+0.00	-1.63	+0.10
	+0.00	-0.00	-0.00	-0.00	+1.38	+0.85	+0.00	+1.79	-0.11
395 - 468	-0.00	+0.00	+0.00	+0.00	-1.35	-0.79	+0.00	-1.37	+0.17
	+0.00	-0.00	-0.00	-0.00	+1.36	+0.80	+0.00	+1.36	-0.13
468 - 548	-0.00	+0.00	+0.00	+0.00	-1.44	-0.88	+0.00	-1.20	+0.28
	+0.00	-0.00	-0.00	-0.00	+1.50	+0.95	+0.00	+1.29	-0.30
548 - 638	-0.00	+0.00	+0.00	+0.00	-1.41	-0.87	+0.00	-1.00	+0.16
	+0.00	-0.00	-0.00	-0.00	+1.31	+0.79	+0.00	+0.94	-0.18
638 - 737	-0.00	+0.00	+0.00	+0.00	-1.52	-0.90	+0.00	-0.71	+0.33
	+0.00	-0.00	-0.00	-0.00	+1.57	+0.94	+0.00	+0.74	-0.32
737 - 846	-0.00	+0.00	+0.00	+0.00	-1.52	-0.95	+0.00	-0.55	+0.30
	+0.00	-0.00	-0.00	-0.00	+1.56	+0.95	+0.00	+0.55	-0.28
846 - 967	-0.00	+0.01	+0.00	+0.00	-1.68	-0.98	+0.00	-0.24	+0.35
	+0.00	-0.01	-0.00	-0.00	+1.61	+0.98	+0.00	+0.24	-0.43
967 - 1101	-0.00	+0.02	+0.00	+0.00	-1.52	-1.03	+0.00	-0.14	+0.46
	+0.00	-0.02	-0.00	-0.00	+1.70	+1.05	+0.00	+0.14	-0.31
1101 - 1248	-0.00	+0.05	+0.00	+0.00	-2.00	-1.03	+0.00	-0.15	+0.42
	+0.00	-0.05	-0.00	-0.00	+1.88	+1.11	+0.00	-0.17	-0.53
1248 - 1410	-0.00	+0.13	+0.00	+0.00	-1.67	-1.20	+0.00	+0.46	+0.52
	+0.00	-0.13	-0.00	-0.00	+1.80	+1.10	+0.00	-0.36	-0.40
1410 - 1588	-0.00	+0.33	+0.00	+0.00	-2.06	-0.86	+0.00	+0.68	+0.70
	+0.00	-0.33	-0.00	-0.00	+2.32	+1.51	+0.00	-0.53	-0.53
1588 - 1784	-0.00	+0.84	+0.00	+0.00	-2.11	-1.80	+0.00	+0.66	+0.44
	+0.00	-0.84	-0.00	-0.00	+1.83	+0.77	+0.00	-1.26	-1.02
1784 - 2000	-0.00	+2.31	+0.00	+0.00	-2.50	-1.81	+0.00	+1.68	+1.08
	+0.00	-2.31	-0.00	-0.00	+2.72	+2.00	+0.00	-1.88	-0.77
2000 - 2238	-0.00	+6.49	+0.00	+0.00	-1.39	-0.58	+0.00	+1.40	-0.04
	+0.00	-6.49	-0.00	-0.00	+1.58	+1.15	+0.00	-0.68	-0.45
	+0.00	+18.70	+0.01	+0.01	-5.06	-5.91	+0.00	+2.88	+3.64



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$p_T$ range in GeV	PileUpDataMC [%]	PileUpPtBB [%]	PileUpPtEC1 [%]	PileUpPtEC2 [%]	PileUpPtHF [%]	PileUpPtRef [%]	RelativeBal [%]	RelativeFSR [%]	RelativeJEREC1 [%]
74 – 97	-0.96	-0.11	+0.18	+0.01	+0.00	-0.18	+0.73	+0.99	+0.30
	+1.41	+0.20	+0.21	+0.01	+0.00	+0.33	+0.61	-0.09	+0.70
97 – 133	-0.66	-0.17	-0.04	-0.00	+0.00	+0.19	-0.25	+0.13	-0.06
	+0.65	+0.17	-0.06	-0.00	+0.00	+0.19	-0.03	-0.32	-0.18
133 – 174	-0.45	-0.12	+0.03	+0.00	+0.00	+0.13	-0.04	+0.31	+0.04
	+0.53	+0.17	+0.03	+0.00	+0.00	+0.15	+0.19	-0.20	+0.08
AK4	-0.43	-0.14	-0.00	-0.00	+0.00	-0.13	-0.23	+0.25	-0.00
AK7	+0.27	+0.04	-0.01	-0.00	+0.00	+0.07	+0.12	-0.32	-0.02
	-0.33	-0.02	-0.00	+0.00	+0.00	-0.07	-0.06	+0.22	+0.01
220 – 272	+0.41	+0.07	+0.00	+0.00	+0.00	+0.07	+0.21	-0.16	-0.00
	-0.23	-0.10	+0.00	+0.00	+0.00	+0.04	-0.31	+0.19	+0.00
272 – 330	+0.21	+0.10	-0.00	+0.00	+0.00	-0.04	+0.22	-0.27	-0.01
	-0.24	+0.00	-0.00	+0.00	+0.00	-0.06	-0.24	+0.15	+0.00
330 – 395	+0.22	-0.01	+0.00	+0.00	+0.00	+0.06	+0.22	-0.16	+0.00
	-0.16	-0.00	-0.00	+0.00	+0.00	+0.06	-0.21	+0.21	+0.00
395 – 468	+0.20	+0.02	+0.00	+0.00	+0.00	-0.05	+0.26	-0.19	-0.00
	-0.18	+0.01	-0.00	+0.00	+0.00	+0.05	-0.25	+0.11	+0.00
468 – 548	+0.17	-0.03	+0.00	+0.00	+0.00	-0.06	+0.25	-0.11	+0.00
	-0.08	-0.00	-0.00	+0.00	+0.00	+0.04	-0.34	+0.15	+0.00
548 – 638	+0.08	+0.00	+0.00	+0.00	+0.00	-0.04	+0.29	-0.23	-0.00
	-0.12	+0.05	-0.00	+0.00	+0.00	+0.06	-0.28	+0.10	+0.00
638 – 737	+0.13	-0.06	+0.00	+0.00	+0.00	-0.06	+0.31	-0.03	-0.00
	-0.14	+0.08	-0.00	-0.00	+0.00	+0.05	-0.37	+0.03	+0.00
737 – 846	+0.13	-0.07	+0.00	-0.00	+0.00	-0.04	+0.39	-0.09	-0.00
	-0.07	+0.02	+0.00	+0.00	+0.00	+0.09	-0.38	+0.04	+0.00
846 – 967	+0.07	-0.04	+0.00	+0.00	+0.00	-0.10	+0.32	-0.04	-0.00
	-0.06	+0.06	+0.00	-0.00	+0.00	+0.09	-0.36	+0.04	+0.00
967 – 1101	+0.06	-0.06	-0.00	+0.00	+0.00	-0.09	+0.41	-0.00	-0.00
	-0.03	+0.10	-0.00	+0.00	+0.00	-0.04	-0.44	+0.02	+0.00
1101 – 1248	+0.07	-0.08	+0.00	-0.00	+0.00	+0.06	+0.47	-0.01	+0.00
	-0.10	-0.03	+0.00	-0.00	+0.00	-0.10	-0.41	-0.18	+0.00
1248 – 1410	+0.06	+0.03	-0.00	+0.00	+0.00	+0.07	+0.37	+0.12	+0.00
	+0.02	+0.16	+0.00	+0.00	+0.00	+0.02	-0.24	+0.27	+0.00
1410 – 1588	+0.14	-0.04	-0.00	-0.00	+0.00	+0.13	+0.83	+0.35	-0.00
	-0.23	-0.17	+0.00	+0.00	+0.00	-0.22	-1.23	-0.92	+0.01
1588 – 1784	-0.11	-0.08	-0.00	+0.00	+0.00	-0.14	-0.10	-0.60	-0.01
	+0.20	+0.13	+0.01	+0.00	+0.00	+0.14	-0.63	+0.37	+0.01
1784 – 2000	+0.36	+0.10	+0.00	-0.00	+0.00	+0.44	+1.50	+1.40	+0.00
	-0.44	+0.12	+0.00	-0.00	+0.00	-0.22	+0.54	+0.82	-0.00
2000 – 2238	-0.01	-0.26	-0.00	+0.00	+0.00	-0.05	+0.21	+0.15	-0.00
	+0.02	+0.05	-0.01	+0.00	+0.00	-0.50	-4.62	-2.41	-0.00
2238 – 2500	-0.17	-0.10	-0.02	-0.00	+0.00	-0.18	-3.62	-2.14	-0.00



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$p_T$ range in GeV	RelativeJEREC2 [%]	RelativeJERHF [%]	RelativePtBB [%]	RelativePtEC1 [%]	RelativePtEC2 [%]	RelativePtHF [%]	RelativeSample [%]	RelativeStatEC [%]	RelativeStatFSR [%]
74 – 97	+0.09	+0.00	+0.29	+0.02	+0.00	+0.00	-0.57	+0.12	-0.07
	+0.19	+0.00	-0.26	+0.02	+0.00	+0.00	+2.36	+0.25	+0.18
	-0.02	+0.00	+0.12	-0.01	-0.00	+0.00	-0.90	-0.03	-0.10
97 – 133	-0.05	+0.00	-0.13	-0.00	-0.00	+0.00	+0.62	-0.06	+0.06
	+0.01	+0.00	+0.05	+0.00	+0.00	+0.00	-0.42	+0.01	-0.06
133 – 174	+0.02	+0.00	-0.01	+0.00	+0.00	+0.00	+0.62	+0.03	+0.12
	-0.00	+0.00	-0.06	+0.00	+0.00	+0.00	-0.26	+0.00	-0.10
174 – 220	-0.00	+0.00	-0.04	-0.00	-0.00	+0.00	+0.10	-0.01	-0.01
	+0.00	+0.00	-0.12	+0.00	+0.00	+0.00	+0.06	+0.01	-0.11
220 – 272	+0.01	+0.00	+0.20	-0.00	+0.00	+0.00	+0.18	-0.00	+0.16
	-0.00	+0.00	+0.16	-0.00	+0.00	+0.00	+0.18	-0.00	+0.08
272 – 330	-0.00	+0.00	+0.08	+0.00	+0.00	+0.00	-0.41	-0.00	+0.06
	+0.00	+0.00	-0.22	+0.00	+0.00	+0.00	+0.50	+0.00	-0.10
330 – 395	+0.00	+0.00	+0.21	-0.00	-0.00	+0.00	-0.40	+0.00	+0.09
	+0.00	+0.00	-0.30	+0.00	+0.00	+0.00	+0.72	+0.00	-0.09
395 – 468	-0.00	+0.00	+0.33	-0.00	-0.00	+0.00	-0.74	-0.00	+0.12
	+0.00	+0.00	-0.39	+0.00	+0.00	+0.00	+0.99	+0.00	-0.11
468 – 548	+0.00	+0.00	+0.40	-0.00	+0.00	+0.00	-0.94	+0.00	+0.10
	+0.00	+0.00	-0.39	+0.00	+0.00	+0.00	+0.98	+0.00	-0.09
548 – 638	+0.00	+0.00	+0.36	-0.00	+0.00	+0.00	-1.04	-0.00	+0.09
	+0.00	+0.00	-0.51	+0.00	+0.00	+0.00	+1.41	+0.00	-0.11
638 – 737	+0.00	+0.00	+0.52	-0.00	-0.00	+0.00	-1.39	-0.00	+0.11
	+0.00	+0.00	-0.57	+0.00	-0.00	+0.00	+1.56	+0.00	-0.11
737 – 846	+0.00	+0.00	+0.57	-0.00	-0.00	+0.00	-1.55	-0.00	+0.12
	+0.00	+0.00	-0.57	+0.00	+0.00	+0.00	+1.79	+0.00	-0.12
846 – 967	+0.00	+0.00	+0.57	-0.00	+0.00	+0.00	-1.76	-0.00	+0.10
	+0.00	+0.00	-0.68	+0.00	-0.00	+0.00	+2.07	+0.00	-0.12
967 – 1101	+0.00	+0.00	+0.69	-0.00	+0.00	+0.00	-1.98	-0.00	+0.12
	+0.00	+0.00	-0.82	+0.00	+0.00	+0.00	+2.30	+0.00	-0.11
1101 – 1248	+0.00	+0.00	+0.81	-0.00	+0.00	+0.00	-2.33	+0.00	+0.14
	+0.00	+0.00	-0.77	+0.00	-0.00	+0.00	+2.50	+0.00	-0.17
1248 – 1410	+0.00	+0.00	+0.93	+0.00	+0.00	+0.00	-2.28	-0.00	+0.13
	+0.00	+0.00	-1.06	+0.00	+0.00	+0.00	+3.33	+0.00	+0.02
1410 – 1588	+0.00	+0.00	+0.97	-0.00	+0.00	+0.00	-3.30	-0.00	+0.22
	+0.00	+0.00	-0.92	+0.01	+0.00	+0.00	+2.92	+0.00	-0.37
1588 – 1784	+0.00	+0.00	+1.30	-0.01	+0.00	+0.00	-2.91	-0.00	-0.06
	+0.00	+0.00	-2.12	+0.01	+0.00	+0.00	+3.54	+0.01	+0.06
1784 – 2000	+0.00	+0.00	+1.11	+0.00	-0.00	+0.00	-3.65	+0.00	+0.50
	+0.00	+0.00	-0.68	-0.00	-0.00	+0.00	+4.26	-0.00	-0.29
2000 – 2238	+0.00	+0.00	+1.39	-0.00	+0.00	+0.00	-3.20	-0.00	-0.04
	+0.00	+0.00	-5.91	-0.00	+0.00	+0.00	+7.14	-0.00	-0.74
2238 – 2500									



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$p_T$ range in GeV	RelativeStatHF [%]	SinglePionECAL [%]	SinglePionHCAL [%]	TimePtEta [%]
74 - 97	+0.00	+0.82	+0.27	-2.17
	+0.00	-0.44	-0.14	+3.65
97 - 133	+0.00	+0.31	+0.09	-2.01
	+0.00	-0.36	-0.12	+1.81
133 - 174	+0.00	+0.20	+0.09	-2.17
	+0.00	-0.14	-0.06	+2.34
174 - 220	+0.00	+0.08	-0.00	-2.56
	+0.00	-0.15	-0.03	+2.47
220 - 272	+0.00	-0.03	-0.01	+2.16
	+0.00	+0.09	+0.07	+2.38
272 - 330	+0.00	-0.07	+0.02	-2.59
	+0.00	+0.04	-0.03	+2.49
330 - 395	+0.00	-0.09	-0.11	-2.40
	+0.00	+0.09	+0.09	+2.69
395 - 468	+0.00	-0.16	-0.04	-2.70
	+0.00	+0.19	+0.08	+2.60
468 - 548	+0.00	-0.19	-0.16	-2.62
	+0.00	+0.18	+0.14	+2.82
548 - 638	+0.00	-0.34	-0.16	-2.63
	+0.00	+0.32	+0.17	+2.54
638 - 737	+0.00	-0.25	-0.10	-2.83
	+0.00	+0.26	+0.09	+2.90
737 - 846	+0.00	-0.38	-0.21	-2.85
	+0.00	+0.40	+0.23	+2.93
846 - 967	+0.00	-0.40	-0.21	-3.03
	+0.00	+0.33	+0.17	+2.92
967 - 1101	+0.00	-0.40	-0.23	-2.91
	+0.00	+0.51	+0.26	+3.27
1101 - 1248	+0.00	-0.55	-0.36	-3.34
	+0.00	+0.50	+0.39	+3.28
1248 - 1410	+0.00	-0.48	-0.23	-3.21
	+0.00	+0.52	+0.20	+3.45
1410 - 1588	+0.00	-0.37	-0.29	-3.62
	+0.00	+0.70	+0.61	+4.00
1588 - 1784	+0.00	-0.99	-0.65	-4.39
	+0.00	+0.26	+0.20	+3.30
1784 - 2000	+0.00	-0.81	-0.48	-3.32
	+0.00	+1.31	+0.79	+4.97
2000 - 2238	+0.00	-0.44	-0.23	-3.71
	+0.00	-0.16	-0.08	+3.36
2238 - 2500	+0.00	-2.75	-2.66	-7.90



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	$p_T$ range in GeV	cross section in pb/GeV	tot. stat. unc. [%]	luminosity [%]	JER [%]	Model [%]	PU [%]	Pref [%]	fakeNoMatch [%]	fakeOutHigh [%]
	74 – 97	$4.9 \times 10^4$	$\pm 0.60$	$\pm 2.0$	+0.37 +0.30	-0.00 +0.00	+0.06 -0.06	+0.01 -0.01	+0.04 -0.04	+0.00 -0.00
	97 – 133	$1.2 \times 10^4$	$\pm 0.44$	$\pm 2.0$	+3.81 -4.38	+0.09 -0.09	+0.36 -0.36	-0.01 +0.01	+0.03 -0.03	+0.00 -0.00
	133 – 174	$2.6 \times 10^3$	$\pm 0.63$	$\pm 2.0$	+1.79 -2.06	+0.07 -0.07	-0.05 +0.05	-0.00 +0.00	+0.02 -0.02	+0.00 -0.00
	174 – 220	$6.8 \times 10^2$	$\pm 0.45$	$\pm 2.0$	+1.86 -2.05	+0.06 -0.06	+0.13 -0.13	-0.01 +0.01	+0.01 -0.01	+0.00 -0.00
	220 – 272	$2 \times 10^2$	$\pm 0.51$	$\pm 2.0$	+1.24 -1.31	+0.05 -0.05	-0.07 +0.05	-0.01 +0.01	+0.01 -0.01	+0.00 -0.00
	272 – 330	63	$\pm 0.36$	$\pm 2.0$	+1.22 -1.48	+0.04 -0.04	+0.08 -0.06	-0.01 +0.01	+0.01 -0.01	+0.00 -0.00
	330 – 395	22	$\pm 0.26$	$\pm 2.0$	+0.97 -0.95	+0.04 -0.04	-0.07 +0.06	-0.01 +0.01	+0.01 -0.01	+0.00 +0.00
	395 – 468	7.7	$\pm 0.23$	$\pm 2.0$	+0.76 -1.00	+0.03 -0.03	+0.00 +0.00	-0.01 +0.01	+0.00 -0.00	+0.00 -0.00
	468 – 548	2.8	$\pm 0.23$	$\pm 2.0$	+0.95 -1.08	+0.03 -0.03	-0.11 +0.11	-0.01 +0.01	+0.00 -0.00	+0.00 +0.00
	548 – 638	1.1	$\pm 0.16$	$\pm 2.0$	+0.94 -0.84	+0.03 -0.03	+0.01 +0.03	-0.01 +0.01	+0.01 -0.01	+0.00 -0.00
	638 – 737	0.4	$\pm 0.20$	$\pm 2.0$	+0.88 -1.20	+0.03 -0.03	-0.11 +0.10	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
	737 – 846	0.15	$\pm 0.29$	$\pm 2.0$	+0.95 -0.85	+0.03 -0.03	-0.05 +0.06	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
	846 – 967	0.058	$\pm 0.45$	$\pm 2.0$	+1.06 -1.33	+0.03 -0.03	-0.06 +0.06	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
	967 – 1101	0.021	$\pm 0.71$	$\pm 2.0$	+1.21 -1.23	+0.03 -0.03	-0.10 +0.10	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
	1101 – 1248	0.0076	$\pm 1.14$	$\pm 2.0$	+1.50 -1.59	+0.03 -0.03	-0.11 +0.11	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
	1248 – 1410	0.0025	$\pm 1.88$	$\pm 2.0$	+1.39 -1.60	+0.03 -0.03	-0.10 +0.10	+0.00 -0.00	+0.00 -0.00	+0.00 -0.00
	1410 – 1588	0.0008	$\pm 3.18$	$\pm 2.0$	+2.23 -2.47	+0.04 -0.04	-0.08 +0.09	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
	1588 – 1784	0.00022	$\pm 5.88$	$\pm 2.0$	+2.79 -2.63	+0.03 -0.03	-0.10 +0.10	+0.00 -0.00	+0.00 -0.00	+0.00 -0.00
	1784 – 2000	$5.6 \times 10^{-5}$	$\pm 10.79$	$\pm 2.0$	+2.60 -4.20	+0.04 -0.04	+0.03 -0.01	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
	2000 – 2238	$1.4 \times 10^{-5}$	$\pm 19.65$	$\pm 2.0$	+3.30 1.95	+0.03 0.02	-0.25 +0.29	+0.00 0.00	+0.00 0.00	+0.00 0.00



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$p_T$ range in GeV	fakeOutLow [%]	missNoMatch [%]	missOutHigh [%]	missOutLow [%]	AbsoluteMPFBias [%]	AbsoluteScale [%]	AbsoluteStat [%]	FlavorQCD [%]	Fragmentation [%]
74 - 97	+0.04	+0.00	+0.00	+0.00	-1.40	-0.80	+0.00	-4.18	-0.44
	-0.04	-0.00	-0.00	-0.00	+2.49	+1.39	+0.00	+8.35	+0.75
97 - 133	-0.02	+0.00	+0.00	+0.00	-1.15	-0.76	+0.00	-3.32	-0.24
	+0.02	-0.00	-0.00	-0.00	+0.96	+0.62	+0.00	+2.65	+0.14
133 - 174	+0.01	+0.00	+0.00	+0.00	-1.32	-0.73	+0.00	-3.08	-0.20
	-0.01	-0.00	-0.00	-0.00	+1.50	+0.91	+0.00	+3.63	+0.31
174 - 220	-0.00	+0.00	+0.00	+0.00	-1.20	-0.75	+0.00	-2.50	-0.09
	+0.00	-0.00	-0.00	-0.00	+1.27	+0.76	+0.00	+2.46	+0.05
220 - 272	+0.00	+0.00	+0.00	+0.00	-1.19	-0.69	+0.00	-2.15	-0.03
	-0.00	-0.00	-0.00	-0.00	+1.32	+0.70	+0.00	+2.27	+0.03
272 - 330	-0.00	+0.00	+0.00	+0.00	-1.50	-0.94	+0.00	-2.06	+0.08
	+0.00	-0.00	-0.00	-0.00	+1.35	+0.85	+0.00	+2.00	-0.06
330 - 395	-0.00	+0.00	+0.00	+0.00	-1.33	-0.80	+0.00	-1.76	+0.11
	+0.00	-0.00	-0.00	-0.00	+1.34	+0.78	+0.00	+1.80	-0.11
395 - 468	-0.00	+0.00	+0.00	+0.00	-1.42	-0.87	+0.00	-1.45	+0.11
	+0.00	-0.00	-0.00	-0.00	+1.45	+0.90	+0.00	+1.50	-0.12
468 - 548	-0.00	+0.00	+0.00	+0.00	-1.43	-0.85	+0.00	-1.23	+0.29
	+0.00	-0.00	-0.00	-0.00	+1.46	+0.87	+0.00	+1.26	-0.28
548 - 638	-0.00	+0.00	+0.00	+0.00	-1.49	-0.92	+0.00	-1.09	+0.23
	+0.00	-0.00	-0.00	-0.00	+1.52	+0.93	+0.00	+1.10	-0.18
638 - 737	-0.00	+0.00	+0.00	+0.00	-1.67	-1.01	+0.00	-0.80	+0.30
	+0.00	-0.00	-0.00	-0.00	+1.66	+1.00	+0.00	+0.80	-0.35
737 - 846	-0.00	+0.01	+0.00	+0.00	-1.52	-0.88	+0.00	-0.57	+0.35
	+0.00	-0.01	-0.00	-0.00	+1.58	+1.00	+0.00	+0.57	-0.30
846 - 967	-0.00	+0.01	+0.00	+0.00	-2.11	-1.41	+0.00	-0.30	+0.37
	+0.00	-0.01	-0.00	-0.00	+1.94	+1.07	+0.00	+0.32	-0.46
967 - 1101	-0.00	+0.04	+0.00	+0.00	-1.61	-0.85	+0.00	-0.15	+0.49
	+0.00	-0.04	-0.00	-0.00	+1.82	+1.24	+0.00	+0.05	-0.40
1101 - 1248	-0.00	+0.10	+0.00	+0.00	-2.12	-1.41	+0.00	-0.27	+0.61
	+0.00	-0.10	-0.00	-0.00	+2.54	+1.31	+0.00	-0.07	-0.47
1248 - 1410	-0.00	+0.30	+0.00	+0.00	-2.25	-1.19	+0.00	+0.51	+0.54
	+0.00	-0.30	-0.00	-0.00	+1.78	+1.25	+0.00	-0.52	-0.65
1410 - 1588	-0.00	+0.90	+0.00	+0.00	-2.74	-1.95	+0.00	+0.67	+0.87
	+0.00	-0.90	-0.00	-0.00	+2.58	+1.38	+0.00	-1.23	-1.00
1588 - 1784	-0.00	+3.18	+0.00	+0.00	-2.00	-1.34	+0.00	+2.69	+1.06
	+0.00	-3.18	-0.00	-0.00	+4.15	+2.89	+0.00	-0.59	-0.71
1784 - 2000	-0.00	+11.50	+0.00	+0.02	-5.17	-2.86	+0.00	-2.16	+0.44
	+0.00	-11.50	-0.00	-0.02	-0.70	-0.50	+0.00	-3.92	-1.55
2000 - 2238	-0.00	+43.93	+0.00	+0.00	-0.66	-0.41	+0.00	+10.60	+3.47
	+0.00	-43.93	-0.00	-0.00	+11.83	+7.41	+0.00	+2.66	+0.45
	+0.00	+5.69	+0.31	+0.36	-48.07	-18.03	+0.00	-24.00	-6.10



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$p_T$ range in GeV	PileUpDataMC [%]	PileUpPtBB [%]	PileUpPtEC1 [%]	PileUpPtEC2 [%]	PileUpPtHF [%]	PileUpPtRef [%]	RelativeBal [%]	RelativeFSR [%]	RelativeJEREC1 [%]
74 – 97	-0.81	-0.59	-0.17	+0.01	+0.00	-0.20	+1.77	+0.90	-0.39
	+1.44	+0.47	+0.38	+0.01	+0.00	+0.38	-1.11	+0.41	+1.09
97 – 133	-0.58	-0.23	-0.15	-0.00	+0.00	+0.20	+0.79	-0.25	-0.34
	+0.46	+0.26	+0.11	-0.00	+0.00	+0.14	-0.87	-0.13	+0.23
133 – 174	-0.41	-0.16	-0.02	+0.00	+0.00	+0.12	+0.55	+0.12	-0.35
	+0.53	+0.15	+0.08	+0.00	+0.00	+0.22	-0.54	+0.14	+0.45
174 – 220	-0.32	-0.02	-0.03	-0.00	+0.00	-0.14	+0.36	-0.13	-0.29
	+0.32	+0.02	+0.00	-0.00	+0.00	+0.03	-0.26	-0.01	+0.28
220 – 272	-0.21	-0.00	+0.07	+0.00	+0.00	-0.08	+0.14	-0.06	-0.22
	+0.23	-0.01	-0.04	+0.00	+0.00	+0.14	-0.10	+0.19	+0.32
272 – 330	-0.27	+0.12	+0.00	+0.00	+0.00	+0.04	-0.31	-0.21	-0.33
	+0.24	-0.10	-0.04	+0.00	+0.00	-0.05	+0.10	+0.07	+0.16
330 – 395	-0.14	+0.11	+0.07	+0.00	+0.00	-0.07	-0.37	-0.16	-0.20
	+0.15	-0.10	-0.08	+0.00	+0.00	+0.06	+0.38	+0.17	+0.21
395 – 468	-0.16	+0.15	+0.06	+0.00	+0.00	+0.04	-0.53	-0.23	-0.23
	+0.15	-0.17	-0.05	-0.00	+0.00	-0.03	+0.57	+0.21	+0.22
468 – 548	-0.08	+0.14	+0.05	+0.00	+0.00	+0.06	-0.71	-0.24	-0.15
	+0.10	-0.11	-0.06	+0.00	+0.00	-0.07	+0.72	+0.28	+0.17
548 – 638	-0.13	+0.13	+0.07	+0.00	+0.00	+0.05	-0.99	-0.26	-0.19
	+0.14	-0.14	-0.04	+0.00	+0.00	-0.03	+1.06	+0.25	+0.19
638 – 737	-0.08	+0.11	+0.02	+0.00	+0.00	+0.07	-1.25	-0.35	-0.14
	+0.07	-0.11	-0.04	+0.00	+0.00	-0.08	+1.22	+0.38	+0.17
737 – 846	-0.04	+0.05	+0.03	-0.00	+0.00	+0.03	-1.31	-0.26	-0.16
	+0.04	-0.06	-0.03	+0.00	+0.00	-0.02	+1.36	+0.21	+0.12
846 – 967	-0.08	+0.02	-0.01	+0.00	+0.00	+0.14	-2.08	-0.49	-0.11
	+0.10	-0.01	+0.02	-0.00	+0.00	-0.12	+1.88	+0.53	+0.14
967 – 1101	-0.05	-0.08	-0.06	-0.00	+0.00	+0.06	-1.75	-0.41	-0.12
	-0.02	+0.04	+0.01	+0.00	+0.00	-0.11	+1.99	+0.43	+0.07
1101 – 1248	-0.06	-0.15	-0.01	+0.00	+0.00	-0.02	-2.68	-0.39	-0.05
	+0.17	+0.23	+0.05	-0.00	+0.00	+0.08	+2.84	+0.32	+0.06
1248 – 1410	-0.04	-0.05	-0.15	-0.00	+0.00	-0.10	-2.67	-0.45	-0.09
	+0.01	+0.19	+0.12	+0.00	+0.00	+0.08	+2.82	+0.88	+0.11
1410 – 1588	-0.08	-0.96	+0.09	+0.00	+0.00	-0.10	-4.60	-0.47	-0.04
	+0.11	+0.59	+0.03	-0.00	+0.00	+0.14	+3.18	+0.05	+0.05
1588 – 1784	-0.08	+0.06	-0.61	-0.00	+0.00	-0.17	-1.70	-0.67	-0.01
	-0.08	+0.46	+0.24	+0.00	+0.00	-0.10	+6.01	+1.04	+0.06
1784 – 2000	+0.10	-2.06	+0.50	+0.00	+0.00	-0.05	-10.16	-0.36	+0.03
	+0.04	+1.05	-0.07	-0.00	+0.00	-0.01	+2.42	-0.58	-0.06
2000 – 2238	-0.10	+0.17	-0.72	+0.00	+0.00	+0.01	+1.32	-0.15	-0.39
	-0.02	+3.65	-0.06	+0.00	+0.00	+0.88	+13.47	+2.38	+0.04
2238 – 2500	-0.18	-3.23	+0.42	+0.00	+0.00	-0.92	-92.35	-18.89	-0.61
	-0.03	0.48	-0.38	-0.00	+0.00	-0.32	28.80	2.60	0.14



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$p_T$ range in GeV	RelativeJEREC2 [%]	RelativeJERHF [%]	RelativePtBB [%]	RelativePtEC1 [%]	RelativePtEC2 [%]	RelativePtHF [%]	RelativeSample [%]	RelativeStatEC [%]	RelativeStatFSR [%]
74 – 97	+0.10	+0.00	+0.32	+0.02	+0.00	+0.00	-3.22	+0.06	-0.11
	+0.22	+0.00	-0.22	-0.03	+0.00	+0.00	+4.47	+0.30	+0.26
97 – 133	-0.03	+0.00	+0.10	+0.02	-0.00	+0.00	-1.89	-0.04	-0.09
	-0.06	+0.00	-0.14	-0.01	-0.00	+0.00	+1.91	-0.06	+0.04
133 – 174	+0.01	+0.00	+0.06	-0.00	+0.00	+0.00	-1.35	-0.05	-0.11
	+0.03	+0.00	-0.04	+0.00	+0.00	+0.00	+1.40	+0.16	+0.18
174 – 220	-0.00	+0.00	-0.07	-0.01	-0.00	+0.00	-0.49	-0.11	-0.11
	-0.00	+0.00	+0.06	-0.00	+0.00	+0.00	+0.51	+0.05	+0.01
220 – 272	+0.00	+0.00	-0.08	+0.02	+0.00	+0.00	-0.03	+0.07	-0.07
	+0.01	+0.00	-0.05	-0.00	+0.00	+0.00	+0.12	+0.16	+0.12
272 – 330	-0.00	+0.00	-0.18	-0.04	+0.00	+0.00	+0.63	-0.19	+0.13
	-0.00	+0.00	+0.22	+0.01	+0.00	+0.00	-0.82	+0.07	+0.10
330 – 395	+0.00	+0.00	-0.20	-0.01	-0.00	+0.00	+1.16	-0.13	-0.11
	+0.00	+0.00	+0.16	+0.01	-0.00	+0.00	-1.16	+0.13	+0.13
395 – 468	+0.00	+0.00	-0.29	-0.03	+0.00	+0.00	+1.77	-0.18	-0.11
	-0.00	+0.00	+0.31	+0.03	-0.00	+0.00	-1.72	+0.18	+0.11
468 – 548	+0.00	+0.00	-0.40	-0.04	+0.00	+0.00	+2.24	-0.15	-0.11
	+0.00	+0.00	+0.39	+0.02	-0.00	+0.00	-2.29	+0.17	+0.11
548 – 638	+0.00	+0.00	-0.39	-0.01	-0.00	+0.00	+2.97	-0.19	-0.10
	+0.00	+0.00	+0.42	+0.04	+0.00	+0.00	-2.89	+0.20	+0.13
638 – 737	+0.00	+0.00	-0.58	-0.03	+0.00	+0.00	+3.50	-0.18	-0.15
	+0.00	+0.00	+0.54	+0.02	-0.00	+0.00	-3.55	+0.20	+0.12
737 – 846	+0.00	+0.00	-0.45	-0.06	-0.00	+0.00	+4.17	-0.24	-0.12
	+0.00	+0.00	+0.58	+0.06	+0.00	+0.00	-3.91	+0.21	+0.12
846 – 967	+0.00	+0.00	-0.94	-0.03	+0.00	+0.00	+5.06	-0.18	-0.16
	+0.00	+0.00	+0.66	+0.04	-0.00	+0.00	-5.27	+0.20	+0.17
967 – 1101	-0.00	+0.00	-0.57	-0.06	-0.00	+0.00	+5.80	-0.23	-0.16
	+0.00	+0.00	+0.81	+0.03	+0.00	+0.00	-5.15	+0.26	+0.07
1101 – 1248	+0.00	+0.00	-1.09	-0.04	+0.00	+0.00	+7.22	-0.19	-0.10
	+0.00	+0.00	+1.16	+0.03	-0.00	+0.00	-6.96	+0.16	+0.25
1248 – 1410	+0.00	+0.00	-0.91	-0.06	-0.00	+0.00	+7.90	-0.28	-0.16
	+0.00	+0.00	+0.90	+0.09	+0.00	+0.00	-7.55	+0.31	+0.13
1410 – 1588	+0.00	+0.00	-2.08	-0.07	-0.00	+0.00	+9.72	+0.06	-0.33
	+0.00	+0.00	+1.36	+0.06	-0.00	+0.00	-9.57	+0.16	+0.28
1588 – 1784	+0.00	+0.00	-0.90	+0.01	-0.00	+0.00	+14.57	-0.56	-0.18
	+0.00	+0.00	+2.88	+0.05	+0.00	+0.00	-8.96	+0.30	-0.16
1784 – 2000	+0.00	+0.00	-3.43	+0.01	+0.00	+0.00	+11.85	+0.24	-0.33
	+0.00	+0.00	-1.40	-0.05	-0.00	+0.00	-18.90	-0.08	+0.48
2000 – 2238	+0.00	+0.00	+1.77	-0.37	+0.00	+0.00	+12.49	-0.89	+0.26
	+0.00	+0.00	+9.48	+0.02	+0.00	+0.00	-8.31	-0.02	+0.69
2238 – 2500	+0.00	+0.00	-47.77	-0.65	+0.00	+0.00	+138.84	-0.93	-1.57





$$1.0 < |y| < 1.5$$

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$p_T$ range in GeV	RelativeStatHF [%]	SinglePionECAL [%]	SinglePionHCAL [%]	TimePtEta [%]
74 – 97	+0.00	+0.86	+0.35	-2.99
	+0.00	-0.48	-0.19	+4.71
97 – 133	+0.00	+0.28	+0.05	-2.12
	+0.00	-0.40	-0.08	+1.89
133 – 174	+0.00	+0.29	+0.14	-2.42
	+0.00	-0.16	-0.10	+2.65
174 – 220	+0.00	+0.07	-0.00	-2.56
	+0.00	-0.12	-0.02	+2.64
220 – 272	+0.00	+0.04	-0.01	-2.28
	+0.00	-0.02	+0.03	+2.38
272 – 330	+0.00	-0.08	+0.03	-2.84
	+0.00	+0.09	-0.07	+2.77
330 – 395	+0.00	-0.09	-0.12	-2.49
	+0.00	+0.09	+0.13	+2.58
395 – 468	+0.00	-0.16	-0.05	-2.72
	+0.00	+0.15	+0.05	+2.77
468 – 548	+0.00	-0.16	-0.13	-2.69
	+0.00	+0.17	+0.14	+2.75
548 – 638	+0.00	-0.34	-0.17	-2.73
	+0.00	+0.38	+0.20	+2.83
638 – 737	+0.00	-0.30	-0.15	-2.92
	+0.00	+0.27	+0.10	+2.91
737 – 846	+0.00	-0.36	-0.17	-2.72
	+0.00	+0.40	+0.20	+2.86
846 – 967	+0.00	-0.52	-0.30	-3.32
	+0.00	+0.43	+0.26	+3.15
967 – 1101	+0.00	-0.40	-0.25	-2.69
	+0.00	+0.45	+0.24	+3.16
1101 – 1248	+0.00	-0.58	-0.41	-3.57
	+0.00	+0.74	+0.50	+3.46
1248 – 1410	+0.00	-0.65	-0.14	-3.06
	+0.00	+0.58	+0.31	+3.92
1410 – 1588	+0.00	-0.84	-0.97	-4.74
	+0.00	+0.66	+0.48	+2.68
1588 – 1784	+0.00	-0.76	-0.02	-1.81
	+0.00	+0.97	+1.35	+6.75
1784 – 2000	+0.00	-1.54	-1.31	-9.83
	+0.00	+0.56	-1.48	+0.49
2000 – 2238	+0.00	+0.49	+0.59	+2.86
	+0.00	+3.35	+4.40	+14.85
2238 – 2500	+0.00	-18.72	-18.84	-95.11



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	$p_T$ range in GeV	cross section in pb/GeV	tot. stat. unc. [%]	luminosity [%]	JER [%]	Model [%]	PU [%]	Pref [%]	fakeNoMatch [%]	fakeOutHigh [%]
	74 – 97	$4.1 \times 10^4$	$\pm 0.63$	$\pm 2.0$	+0.32 +0.14	-0.00 +0.00	-0.03 +0.04	-0.00 +0.00	+0.03 -0.03	+0.00 -0.00
	97 – 133	$9.7 \times 10^3$	$\pm 0.46$	$\pm 2.0$	+4.25 -4.55	+0.08 -0.09	+0.08 -0.07	+0.02 +0.02	+0.03 -0.03	+0.00 -0.00
	133 – 174	$2.1 \times 10^3$	$\pm 0.64$	$\pm 2.0$	+1.45 -1.94	+0.06 -0.06	-0.20 +0.20	-0.02 +0.02	+0.01 -0.01	+0.00 -0.00
	174 – 220	$5.3 \times 10^2$	$\pm 0.48$	$\pm 2.0$	+1.54 -1.67	+0.05 -0.05	-0.09 +0.11	-0.02 +0.02	+0.01 -0.01	+0.00 -0.00
	220 – 272	$1.5 \times 10^2$	$\pm 0.57$	$\pm 2.0$	+1.17 -1.44	+0.04 -0.04	-0.16 +0.17	-0.03 +0.03	+0.01 -0.01	+0.00 -0.00
	272 – 330	47	$\pm 0.38$	$\pm 2.0$	+0.58 -0.68	+0.04 -0.04	-0.16 +0.18	-0.02 +0.02	+0.01 -0.01	+0.00 -0.00
	330 – 395	15	$\pm 0.26$	$\pm 2.0$	+0.90 -0.96	+0.03 -0.03	-0.15 +0.17	-0.03 +0.03	+0.00 -0.00	+0.00 -0.00
	395 – 468	5.2	$\pm 0.23$	$\pm 2.0$	+0.71 -0.97	+0.03 -0.03	-0.17 +0.18	-0.02 +0.02	+0.00 -0.00	+0.00 -0.00
	468 – 548	1.8	$\pm 0.24$	$\pm 2.0$	+0.86 -0.81	+0.03 -0.03	-0.16 +0.17	-0.02 +0.02	+0.00 -0.00	+0.00 +0.00
	548 – 638	0.6	$\pm 0.16$	$\pm 2.0$	+0.80 -1.13	+0.03 -0.03	-0.16 +0.17	-0.01 +0.01	+0.00 -0.00	+0.00 -0.00
	638 – 737	0.2	$\pm 0.22$	$\pm 2.0$	+1.15 -1.08	+0.03 -0.03	-0.28 +0.28	-0.01 +0.01	+0.00 -0.00	+0.00 +0.00
	737 – 846	0.064	$\pm 0.35$	$\pm 2.0$	+1.01 -1.30	+0.03 -0.03	-0.18 +0.19	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
	846 – 967	0.019	$\pm 0.61$	$\pm 2.0$	+1.54 -1.51	+0.03 -0.03	-0.25 +0.26	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
	967 – 1101	0.0054	$\pm 1.09$	$\pm 2.0$	+1.71 -2.07	+0.03 -0.03	-0.20 +0.20	-0.00 +0.00	+0.00 -0.00	+0.00 +0.00
	1101 – 1248	0.0013	$\pm 2.13$	$\pm 2.0$	+1.67 -2.07	+0.03 -0.03	-0.38 +0.38	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
	1248 – 1410	0.00026	$\pm 4.93$	$\pm 2.0$	+4.28 -4.64	+0.04 -0.04	-0.07 +0.09	-0.00 +0.00	+0.00 -0.00	+0.00 -0.00
	1410 – 1588	$5 \times 10^{-5}$	$\pm 10.64$	$\pm 2.0$	+3.04 -2.08	+0.05 -0.05	-0.95 +0.91	+0.00 -0.00	+0.00 -0.00	+0.00 -0.00
	1588 – 1784	$3.2 \times 10^{-6}$	$\pm 65.08$	$\pm 2.0$	+34.37 -34.98	+0.23 -0.22	+3.28 -3.94	-0.01 +0.01	-0.00 +0.00	+0.00 +0.00
	1784 – 2000	$2.6 \times 10^{-6}$	$\pm 68.93$	$\pm 2.0$	-13.87 +8.80	-0.06 +0.06	-0.39 +0.83	+0.00 -0.00	+0.01 -0.01	+0.00 +0.00
	2000 – 2238	0	$\pm 0.00$	$\pm 2.0$	+0.00 -0.00	+0.00 -0.00	+0.00 -0.00	+0.00 -0.00	+0.00 -0.00	+0.00 +0.00



$$1.5 < |y| < 2.0$$

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$p_T$ range in GeV	fakeOutLow [%]	missNoMatch [%]	missOutHigh [%]	missOutLow [%]	AbsoluteMPFBias [%]	AbsoluteScale [%]	AbsoluteStat [%]	FlavorQCD [%]	Fragmentation [%]
74 - 97	+0.04	+0.00	+0.00	+0.00	-1.36	-0.83	+0.00	-4.29	-0.55
	-0.04	-0.00	-0.00	-0.00	+2.05	+1.19	+0.00	+7.55	+0.77
97 - 133	-0.01	+0.00	+0.00	+0.00	-1.31	-0.79	+0.00	-3.58	-0.22
	+0.01	-0.00	-0.00	-0.00	+1.22	+0.73	+0.00	+3.17	+0.19
133 - 174	+0.01	+0.00	+0.00	+0.00	-1.17	-0.72	+0.00	-2.97	-0.27
	-0.01	-0.00	-0.00	-0.00	+1.30	+0.78	+0.00	+3.49	+0.28
174 - 220	-0.00	+0.00	+0.00	+0.00	-1.33	-0.78	+0.00	-2.58	-0.08
	+0.00	-0.00	-0.00	-0.00	+1.54	+1.12	+0.00	+2.63	+0.11
220 - 272	+0.00	+0.00	+0.00	+0.00	-1.16	-0.71	+0.00	-2.28	-0.02
	-0.00	-0.00	-0.00	-0.00	+1.28	+0.67	+0.00	+2.51	+0.01
272 - 330	-0.00	+0.00	+0.00	+0.00	-1.42	-0.87	+0.00	-2.02	+0.07
	+0.00	-0.00	-0.00	-0.00	+1.40	+0.86	+0.00	+2.07	-0.07
330 - 395	-0.00	+0.00	+0.00	+0.00	-1.40	-0.85	+0.00	-1.79	+0.06
	+0.00	-0.00	-0.00	-0.00	+1.41	+0.78	+0.00	+1.82	-0.07
395 - 468	-0.00	+0.00	+0.00	+0.00	-1.52	-0.95	+0.00	-1.56	+0.18
	+0.00	-0.00	-0.00	-0.00	+1.49	+0.92	+0.00	+1.54	-0.17
468 - 548	-0.00	+0.00	+0.00	+0.00	-1.56	-0.95	+0.00	-1.29	+0.30
	+0.00	-0.00	-0.00	-0.00	+1.72	+1.03	+0.00	+1.40	-0.31
548 - 638	-0.00	+0.00	+0.00	+0.00	-1.71	-1.04	+0.00	-1.14	+0.25
	+0.00	-0.00	-0.00	-0.00	+1.75	+1.10	+0.00	+1.21	-0.23
638 - 737	-0.00	+0.00	+0.00	+0.00	-1.87	-1.14	+0.00	-0.81	+0.44
	+0.00	-0.00	-0.00	-0.00	+1.93	+1.15	+0.00	+0.82	-0.40
737 - 846	-0.00	+0.01	+0.00	+0.00	-2.11	-1.34	+0.00	-0.60	+0.38
	+0.00	-0.01	-0.00	-0.00	+2.03	+1.25	+0.00	+0.61	-0.42
846 - 967	-0.00	+0.04	+0.00	+0.00	-2.20	-1.24	+0.00	-0.22	+0.55
	+0.00	-0.04	-0.00	-0.00	+2.43	+1.49	+0.00	+0.17	-0.55
967 - 1101	-0.00	+0.16	+0.00	+0.00	-2.97	-1.83	+0.00	-0.05	+0.68
	+0.00	-0.16	-0.00	-0.00	+2.60	+1.48	+0.00	+0.08	-0.68
1101 - 1248	-0.00	+0.66	+0.00	+0.00	-2.57	-1.60	+0.00	+0.64	+0.75
	+0.00	-0.66	-0.00	-0.00	+3.28	+1.95	+0.00	-0.59	-0.86
1248 - 1410	-0.00	+3.42	+0.00	+0.00	-2.41	-1.80	+0.00	+0.78	+0.82
	+0.00	-3.42	-0.00	-0.00	+2.49	+1.34	+0.00	-1.04	-0.59
1410 - 1588	-0.00	+18.41	+0.00	+0.02	-7.68	-4.35	+0.00	+2.37	+3.08
	+0.00	-18.41	-0.00	-0.02	+8.52	+5.10	+0.00	-2.66	-3.43
1588 - 1784	-0.00	+272.17	+0.00	+0.00	+50.73	+24.74	+0.00	+16.44	-4.56
	+0.00	-272.17	-0.00	-0.00	+11.25	+15.63	+0.00	+18.98	+24.74
1784 - 2000	-0.00	+324.81	+0.00	+1.96	-44.34	-21.47	+0.00	-4.82	+1.69
	+0.00	-324.81	-0.00	-1.96	-4.28	-5.15	+0.00	-18.31	-22.15
2000 - 2238	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00



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$p_T$ range in GeV	PileUpDataMC [%]	PileUpPtBB [%]	PileUpPtEC1 [%]	PileUpPtEC2 [%]	PileUpPtHF [%]	PileUpPtRef [%]	RelativeBal [%]	RelativeFSR [%]	RelativeJEREC1 [%]
74 - 97	-0.66	+0.05	-0.79	+0.01	+0.00	-0.17	+1.54	+1.78	-1.95
	+1.25	+0.13	+0.44	+0.00	+0.00	+0.34	-0.64	-1.80	+1.62
97 - 133	-0.48	-0.01	-0.30	-0.00	+0.00	-0.22	+0.68	+0.98	-1.24
	+0.32	-0.04	+0.47	-0.00	+0.00	+0.19	-0.88	-0.95	+1.44
133 - 174	-0.32	+0.01	-0.25	+0.00	+0.00	-0.16	+0.61	+0.65	-1.18
	+0.43	+0.02	+0.16	+0.00	+0.00	+0.13	-0.50	-0.53	+1.16
174 - 220	0.28	0.00	-0.01	-0.00	+0.00	-0.14	+0.56	+0.15	-1.16
	+0.40	-0.00	+0.05	+0.00	+0.00	+0.23	-0.53	-0.23	+1.30
220 - 272	-0.14	+0.00	-0.03	+0.00	+0.00	+0.08	+0.27	+0.01	+1.04
	+0.16	+0.00	+0.02	+0.00	+0.00	+0.06	-0.25	+0.11	+1.10
272 - 330	-0.18	-0.00	+0.11	-0.00	+0.00	+0.03	+0.31	-0.50	-0.99
	+0.21	-0.00	-0.09	+0.00	+0.00	-0.03	-0.25	+0.43	+1.01
330 - 395	-0.12	-0.00	+0.14	+0.00	+0.00	-0.06	+0.12	-0.81	-0.97
	+0.09	+0.00	-0.17	-0.00	+0.00	+0.05	-0.13	+0.78	+0.88
395 - 468	-0.13	-0.00	+0.18	+0.00	+0.00	+0.06	-0.08	-1.18	-0.92
	+0.15	+0.00	-0.18	-0.00	+0.00	-0.04	+0.06	+1.14	+0.92
468 - 548	-0.08	-0.00	+0.20	+0.00	+0.00	+0.04	-0.08	-1.55	-0.80
	+0.06	+0.00	-0.19	-0.00	+0.00	-0.06	+0.11	+1.67	+0.84
548 - 638	-0.06	-0.00	+0.16	+0.00	+0.00	+0.06	-0.24	-1.97	-0.91
	+0.06	+0.00	-0.17	-0.00	+0.00	-0.06	+0.31	+2.02	+1.00
638 - 737	-0.07	-0.00	+0.15	+0.00	+0.00	+0.07	-0.36	-2.63	-0.80
	+0.07	+0.00	-0.14	-0.00	+0.00	-0.08	+0.39	+2.68	+0.79
737 - 846	-0.08	-0.00	+0.07	-0.00	+0.00	+0.05	-0.46	-3.28	-0.82
	+0.08	+0.00	-0.07	-0.00	+0.00	-0.06	+0.34	+3.16	+0.82
846 - 967	-0.11	-0.00	-0.02	+0.00	+0.00	+0.13	-0.58	-3.77	-0.72
	+0.08	-0.00	-0.01	-0.00	+0.00	-0.13	+0.83	+4.16	+0.68
967 - 1101	+0.01	+0.00	-0.17	-0.00	+0.00	+0.10	-1.10	-5.02	-0.82
	+0.00	-0.00	+0.24	+0.00	+0.00	-0.06	+0.60	+4.93	+0.89
1101 - 1248	-0.03	+0.01	-0.70	-0.00	+0.00	-0.34	-0.40	-5.33	-0.78
	+0.05	-0.01	+0.48	+0.00	+0.00	+0.20	+1.13	+6.46	+0.57
1248 - 1410	+0.04	+0.02	-0.41	+0.00	+0.00	+0.34	-1.28	-7.66	-0.60
	-0.06	-0.02	+0.97	-0.00	+0.00	-0.25	+0.96	+6.90	+1.04
1410 - 1588	-0.02	+0.08	-3.31	-0.00	+0.00	-0.46	-3.10	-10.12	-1.93
	+0.04	-0.04	+0.96	+0.00	+0.00	+0.98	+1.13	+11.62	+1.56
1588 - 1784	+0.14	-0.02	+20.76	+0.00	+0.00	+0.47	+47.46	+69.80	+23.65
	-0.01	-0.10	+20.19	-0.00	+0.00	-1.99	+2.16	+21.64	-1.02
1784 - 2000	-0.15	+0.29	-20.23	+0.00	+0.00	-0.22	-43.38	-82.45	-22.25
	+0.01	-0.11	-6.49	+0.00	+0.00	+0.70	-4.24	+37.28	-0.11
2000 - 2238	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00



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$p_T$ range in GeV	RelativeJEREC2 [%]	RelativeJERHF [%]	RelativePtBB [%]	RelativePtEC1 [%]	RelativePtEC2 [%]	RelativePtHF [%]	RelativeSample [%]	RelativeStatEC [%]	RelativeStatFSR [%]
74 – 97	+0.19	+0.00	+0.12	+0.03	+0.00	+0.00	+2.45	-0.91	-0.17
	+0.15	+0.00	+0.09	-0.02	+0.00	+0.00	-1.89	+0.50	+0.28
97 – 133	-0.00	+0.00	-0.03	+0.01	-0.00	+0.00	+2.22	-0.69	-0.14
	-0.08	+0.00	-0.02	-0.01	-0.00	+0.00	-2.26	+0.82	+0.10
133 – 174	+0.04	+0.00	+0.01	+0.00	+0.00	+0.00	+2.11	-0.78	-0.19
	+0.00	+0.00	+0.01	-0.00	+0.00	+0.00	-1.87	+0.75	+0.19
174 – 220	+0.01	+0.00	-0.00	+0.02	-0.00	+0.00	+1.89	-0.99	+0.18
	-0.01	+0.00	-0.00	-0.01	-0.00	+0.00	-1.94	+1.06	+0.21
220 – 272	+0.01	+0.00	+0.00	-0.01	+0.00	+0.00	+2.13	-0.72	-0.11
	-0.01	+0.00	-0.00	+0.02	+0.00	+0.00	-1.86	+0.90	+0.13
272 – 330	+0.01	+0.00	+0.00	-0.07	+0.00	+0.00	+1.96	-1.12	-0.17
	-0.01	+0.00	-0.01	+0.08	-0.00	+0.00	-1.96	+1.08	+0.22
330 – 395	+0.01	+0.00	+0.00	-0.04	+0.00	+0.00	+1.98	-1.05	-0.17
	-0.00	+0.00	-0.00	+0.04	-0.00	+0.00	-1.95	+1.04	+0.10
395 – 468	+0.00	+0.00	+0.00	-0.08	+0.00	+0.00	+2.06	-1.24	-0.18
	-0.00	+0.00	-0.00	+0.09	-0.00	+0.00	-2.08	+1.20	+0.22
468 – 548	+0.00	+0.00	+0.00	-0.10	+0.00	+0.00	+2.29	-1.26	-0.20
	-0.00	+0.00	-0.01	+0.08	-0.00	+0.00	-2.16	+1.39	+0.17
548 – 638	+0.00	+0.00	+0.01	-0.07	+0.00	+0.00	+2.38	-1.53	-0.20
	-0.00	+0.00	-0.01	+0.08	-0.00	+0.00	-2.27	+1.57	+0.21
638 – 737	+0.00	+0.00	+0.01	-0.12	+0.00	+0.00	+2.61	-1.62	-0.23
	-0.00	+0.00	-0.01	+0.12	-0.00	+0.00	-2.53	+1.67	+0.25
737 – 846	+0.00	+0.00	+0.01	-0.15	+0.00	+0.00	+2.92	-1.95	-0.24
	-0.00	+0.00	-0.01	+0.14	-0.00	+0.00	-2.84	+1.88	+0.23
846 – 967	+0.00	+0.00	+0.02	-0.16	+0.00	+0.00	+3.54	-1.93	-0.30
	+0.00	+0.00	-0.02	+0.13	-0.00	+0.00	-3.29	+2.14	+0.26
967 – 1101	+0.00	+0.00	+0.02	-0.09	-0.00	+0.00	+4.40	-2.86	-0.23
	+0.00	+0.00	-0.03	+0.21	+0.00	+0.00	-4.48	+2.50	+0.31
1101 – 1248	-0.00	+0.00	+0.05	-0.57	-0.00	+0.00	+5.16	-2.36	-0.47
	+0.00	+0.00	-0.05	+0.27	+0.00	+0.00	-4.84	+3.14	+0.38
1248 – 1410	+0.00	+0.00	+0.08	+0.09	+0.00	+0.00	+7.11	-2.66	-0.34
	-0.00	+0.00	-0.04	+0.46	-0.00	+0.00	-6.50	+2.05	+0.07
1410 – 1588	-0.00	+0.00	+0.21	-1.66	-0.00	+0.00	+15.20	-7.07	-0.07
	+0.00	+0.00	-0.25	+1.19	+0.00	+0.00	-13.27	+8.62	+2.14
1588 – 1784	+0.00	+0.00	-0.04	+23.37	+0.00	+0.00	+54.92	+48.81	-0.18
	-0.00	+0.00	-0.89	+0.16	-0.00	+0.00	-38.50	+13.24	-1.77
1784 – 2000	+0.00	+0.00	+0.76	-22.18	+0.00	+0.00	+2.07	-44.86	+0.32
	+0.00	+0.00	-0.02	-0.67	+0.00	+0.00	-62.79	-4.49	-0.03
2000 – 2238	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00



$$1.5 < |y| < 2.0$$

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$p_T$ range in GeV	RelativeStatHF [%]	SinglePionECAL [%]	SinglePionHCAL [%]	TimePtEta [%]
74 - 97	+0.00	+0.88	+0.31	-2.49
	+0.00	-0.61	-0.19	+3.48
97 - 133	+0.00	+0.31	+0.07	-2.38
	+0.00	-0.38	-0.10	+2.28
133 - 174	+0.00	+0.29	+0.12	-2.49
	+0.00	-0.25	-0.12	+2.82
174 - 220	+0.00	+0.12	-0.00	-2.49
	+0.00	-0.11	-0.01	+2.48
220 - 272	+0.00	+0.01	-0.01	-2.61
	+0.00	-0.02	+0.01	+2.93
272 - 330	+0.00	-0.07	+0.02	-2.76
	+0.00	+0.08	-0.02	+2.73
330 - 395	+0.00	-0.07	-0.10	-2.79
	+0.00	+0.05	+0.09	+2.97
395 - 468	+0.00	-0.19	-0.07	-2.91
	+0.00	+0.20	+0.07	+2.84
468 - 548	+0.00	-0.22	-0.17	-3.08
	+0.00	+0.20	+0.15	+3.27
548 - 638	+0.00	-0.40	-0.20	-3.20
	+0.00	+0.43	+0.20	+3.31
638 - 737	+0.00	-0.32	-0.13	-3.38
	+0.00	+0.37	+0.16	+3.51
737 - 846	+0.00	-0.56	-0.31	-3.69
	+0.00	+0.51	+0.28	+3.68
846 - 967	+0.00	-0.48	-0.28	-3.83
	+0.00	+0.48	+0.28	+4.12
967 - 1101	+0.00	-0.85	-0.42	-4.61
	+0.00	+0.85	+0.48	+4.55
1101 - 1248	+0.00	-0.79	-0.74	-4.20
	+0.00	+0.66	+0.42	+4.80
1248 - 1410	+0.00	-0.91	-0.20	-5.38
	+0.00	+1.11	+0.82	+6.09
1410 - 1588	+0.00	-2.62	-2.08	-9.01
	+0.00	+2.25	+1.68	+8.92
1588 - 1784	+0.00	+24.27	+23.96	+73.57
	+0.00	-3.28	-1.59	+15.76
1784 - 2000	+0.00	-21.91	-21.97	-83.07
	+0.00	+1.03	+0.07	+33.74
2000 - 2238	+0.00	+0.00	+0.00	+0.00
	+0.00	+0.00	+0.00	+0.00



$$2.0 < |y| < 2.5$$

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$p_T$ range in GeV	cross section in pb/GeV	tot. stat. unc. [%]	luminosity [%]	JER [%]	Model [%]	PU [%]	Pref [%]	fakeNoMatch [%]	fakeOutHigh [%]
74 - 97	$3 \times 10^4$	$\pm 0.74$	$\pm 2.0$	+0.41 +1.39	-0.00 +0.00	-0.12 -0.12	+0.04 -0.03	+0.09 -0.09	+0.00 -0.00
97 - 133	$7.5 \times 10^3$	$\pm 0.51$	$\pm 2.0$	+4.82 -6.14	+0.08 -0.08	+0.81 -0.82	+0.08 -0.08	+0.03 -0.03	+0.00 -0.00
133 - 174	$1.5 \times 10^3$	$\pm 0.71$	$\pm 2.0$	+2.22 -3.03	+0.06 -0.06	+0.24 -0.24	+0.09 -0.09	+0.02 -0.02	+0.00 -0.00
174 - 220	$3.7 \times 10^2$	$\pm 0.54$	$\pm 2.0$	+1.94 -2.35	+0.05 -0.05	+0.16 -0.16	+0.39 -0.38	+0.01 -0.01	+0.00 -0.00
220 - 272	96	$\pm 0.66$	$\pm 2.0$	+2.06 -2.27	+0.04 -0.04	-0.05 +0.06	-0.08 +0.07	+0.01 -0.01	+0.00 -0.00
272 - 330	27	$\pm 0.47$	$\pm 2.0$	+1.33 -1.85	+0.04 -0.04	-0.02 +0.03	+0.31 -0.30	+0.01 -0.01	+0.00 -0.00
330 - 395	8	$\pm 0.34$	$\pm 2.0$	+1.55 -1.79	+0.03 -0.03	-0.14 +0.14	+0.23 -0.22	+0.01 -0.01	+0.00 -0.00
395 - 468	2.3	$\pm 0.34$	$\pm 2.0$	+1.54 -1.83	+0.03 -0.03	-0.18 +0.20	+0.14 -0.13	+0.01 -0.01	-0.00 +0.00
468 - 548	0.63	$\pm 0.38$	$\pm 2.0$	+1.24 -1.52	+0.03 -0.03	-0.25 +0.26	+0.16 -0.16	+0.01 -0.01	+0.00 -0.00
548 - 638	0.16	$\pm 0.30$	$\pm 2.0$	+1.37 -2.03	+0.03 -0.03	-0.16 +0.18	+0.15 -0.15	+0.01 -0.01	-0.00 +0.00
638 - 737	0.039	$\pm 0.46$	$\pm 2.0$	+1.98 -2.18	+0.03 -0.03	-0.44 +0.45	+0.14 -0.13	+0.00 -0.00	+0.00 -0.00
737 - 846	0.008	$\pm 0.93$	$\pm 2.0$	+2.35 -2.51	+0.04 -0.04	-0.10 +0.12	+0.15 -0.15	+0.00 -0.00	-0.00 +0.00
846 - 967	0.0014	$\pm 2.09$	$\pm 2.0$	+3.27 -3.54	+0.04 -0.04	-0.45 +0.48	+0.16 -0.15	+0.00 -0.00	+0.00 -0.00
967 - 1101	0.00018	$\pm 5.96$	$\pm 2.0$	+6.75 -8.33	+0.05 -0.05	-0.24 +0.19	+0.11 -0.10	+0.00 -0.00	-0.00 +0.00
1101 - 1248	$2.2 \times 10^{-5}$	$\pm 16.46$	$\pm 2.0$	-0.09 -3.29	+0.03 -0.03	-0.86 +0.93	+0.11 -0.11	-0.00 +0.00	+0.00 -0.00
1248 - 1410	0	$\pm 0.00$	$\pm 2.0$	+0.00 +0.00	+0.00 +0.00	+0.00 +0.00	+0.00 +0.00	+0.00 +0.00	+0.00 +0.00
1410 - 1588	$6.5 \times 10^{-6}$	$\pm 80.57$	$\pm 2.0$	-8.22 -41.83	-0.13 +0.13	-4.32 +6.59	-0.16 +0.17	+0.00 -0.00	+0.00 -0.00



$$2.0 < |y| < 2.5$$

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$p_T$ range in GeV	fakeOutLow [%]	missNoMatch [%]	missOutHigh [%]	missOutLow [%]	AbsoluteMPFBias [%]	AbsoluteScale [%]	AbsoluteStat [%]	FlavorQCD [%]	Fragmentation [%]
74 - 97	+0.04	+0.00	+0.00	+0.00	-1.65	-0.89	+0.00	-5.01	-0.39
	-0.04	-0.00	-0.00	-0.00	+2.27	+1.34	+0.00	+8.71	+0.86
	-0.01	+0.00	+0.00	+0.00	-1.01	-0.65	+0.00	+3.04	-0.29
97 - 133	+0.01	+0.00	+0.00	+0.00	+0.95	+0.50	+0.00	+2.98	+0.12
	+0.01	+0.00	+0.00	+0.00	-1.57	-0.97	+0.00	+3.58	-0.18
133 - 174	-0.01	+0.00	+0.00	+0.00	+1.54	+0.98	+0.00	+3.71	+0.26
	-0.00	+0.00	+0.00	+0.00	-1.69	-1.08	+0.00	-2.97	-0.14
174 - 220	+0.00	-0.00	-0.00	-0.00	+1.14	+0.68	+0.00	+2.12	+0.14
	+0.00	+0.00	+0.00	+0.00	-1.18	-0.70	+0.00	-2.08	+0.02
220 - 272	-0.00	-0.00	-0.00	-0.00	+1.29	+0.83	+0.00	+2.42	-0.06
	-0.00	+0.00	+0.00	+0.00	-1.59	-0.98	+0.00	-2.21	+0.13
272 - 330	+0.00	-0.00	-0.00	-0.00	+1.67	+0.92	+0.00	+2.33	-0.07
	-0.00	+0.00	+0.00	+0.00	-1.69	-1.01	+0.00	-2.00	+0.11
330 - 395	+0.00	-0.00	-0.00	-0.00	+1.59	+1.00	+0.00	+1.89	-0.14
	-0.00	+0.00	+0.00	+0.00	-1.86	-1.10	+0.00	-1.73	+0.27
395 - 468	+0.00	-0.00	-0.00	-0.00	+2.03	+1.28	+0.00	+1.92	-0.25
	-0.00	+0.01	+0.00	+0.00	-2.10	-1.31	+0.00	-1.60	+0.40
468 - 548	+0.00	-0.01	-0.00	-0.00	+1.89	+1.08	+0.00	+1.42	-0.34
	-0.00	+0.03	+0.00	+0.00	-2.26	-1.37	+0.00	-1.27	+0.31
548 - 638	+0.00	-0.03	-0.00	-0.00	+2.30	+1.53	+0.00	+1.33	-0.37
	-0.00	+0.12	+0.00	+0.00	-2.72	-1.58	+0.00	-0.89	+0.56
638 - 737	+0.00	-0.12	-0.00	-0.00	+2.56	+1.50	+0.00	+0.91	-0.57
	-0.00	+0.47	+0.00	+0.00	-2.77	-1.81	+0.00	-0.58	+0.65
737 - 846	+0.00	-0.47	-0.00	-0.00	+3.45	+2.14	+0.00	+0.69	-0.48
	-0.00	+2.24	+0.00	+0.00	-3.85	-2.04	+0.00	-0.01	+1.02
846 - 967	+0.00	-2.24	-0.00	-0.00	+2.84	+1.81	+0.00	+0.00	-1.13
	-0.00	+14.06	+0.00	+0.06	-3.64	-2.92	+0.00	-0.05	+1.34
967 - 1101	+0.00	-14.06	-0.00	-0.06	+6.61	+3.91	+0.00	-0.54	-1.39
	+0.00	+114.19	+0.00	+0.00	-4.83	-1.72	+0.00	+2.27	+1.53
1101 - 1248	-0.00	-114.19	-0.00	-0.00	+0.21	+1.03	+0.00	+0.09	+0.70
	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
1248 - 1410	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	-0.00	+297.14	+0.00	+0.00	-6.60	-0.50	+0.00	+3.42	+3.48
1410 - 1588	+0.00	-297.14	-0.00	-0.00	-26.66	+2.74	+0.00	-1.79	-0.83





$$2.0 < |y| < 2.5$$

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$p_T$ range in GeV	PileUpDataMC [%]	PileUpPtBB [%]	PileUpPtEC1 [%]	PileUpPtEC2 [%]	PileUpPtHF [%]	PileUpPtRef [%]	RelativeBaI [%]	RelativeFSR [%]	RelativeJEREC1 [%]
74 - 97	-0.69	+0.05	-0.43	-0.19	+0.00	-0.07	+3.50	+1.66	-4.23
97 - 133	+1.24	+0.16	+0.48	+0.09	+0.00	+0.33	-4.70	-1.33	+3.02
	-0.50	-0.01	-0.14	+0.00	+0.00	+0.26	+2.37	+0.52	-1.98
133 - 174	+0.37	-0.04	+0.15	+0.00	+0.00	+0.17	-1.62	-0.46	+2.83
	-0.51	+0.01	-0.21	-0.03	+0.00	-0.09	+1.72	+0.11	-2.85
174 - 220	+0.44	+0.02	+0.20	+0.01	+0.00	+0.12	-2.14	-0.03	+2.52
	-0.30	-0.00	-0.02	+0.08	+0.00	-0.21	+0.64	-0.61	-2.64
220 - 272	+0.31	-0.00	+0.01	-0.04	+0.00	+0.21	-0.97	+0.03	+1.97
	-0.34	+0.00	-0.11	-0.02	+0.00	-0.01	+0.52	-0.57	-2.04
272 - 330	+0.22	+0.00	+0.06	-0.00	+0.00	+0.01	-0.41	+0.76	+2.38
	-0.16	-0.00	-0.06	+0.02	+0.00	+0.00	-0.56	-1.42	-2.31
330 - 395	+0.22	-0.00	+0.01	-0.00	+0.00	+0.01	+0.67	+1.35	+2.24
	-0.20	-0.00	+0.04	-0.01	+0.00	-0.05	-1.04	-1.70	-2.22
395 - 468	+0.17	+0.00	-0.05	+0.01	+0.00	+0.04	+0.97	+1.57	+2.24
	-0.15	+0.00	+0.03	-0.01	+0.00	+0.10	-1.96	-2.43	-2.16
468 - 548	+0.16	-0.00	-0.03	+0.02	+0.00	-0.08	+2.18	+2.52	+2.33
	-0.12	-0.00	+0.09	-0.04	+0.00	+0.10	-2.83	-2.98	-2.17
548 - 638	+0.18	+0.00	-0.06	+0.02	+0.00	-0.06	+2.57	+2.83	+1.99
	-0.14	-0.00	+0.11	-0.02	+0.00	+0.06	-3.85	-3.76	-2.11
638 - 737	+0.13	+0.00	-0.18	+0.04	+0.00	-0.07	+4.05	+4.03	+2.24
	-0.13	+0.00	+0.07	-0.06	+0.00	+0.10	-5.42	-4.87	-1.96
737 - 846	+0.10	+0.00	-0.06	+0.04	+0.00	-0.12	+5.23	+4.66	+1.87
	-0.08	-0.00	+0.17	+0.01	+0.00	+0.11	-6.55	-5.82	-1.74
846 - 967	+0.10	-0.00	-0.17	+0.01	+0.00	-0.08	+7.70	+6.94	+2.06
	-0.15	-0.00	+0.23	-0.03	+0.00	+0.15	-9.34	-7.79	-1.54
967 - 1101	+0.13	+0.00	+0.00	+0.04	+0.00	-0.21	+8.46	+6.74	+1.50
	-0.21	-0.00	+0.56	+0.03	+0.00	-0.06	-11.04	-10.16	-1.67
1101 - 1248	+0.06	-0.01	-0.60	-0.04	+0.00	+0.08	+15.66	+14.65	+1.85
	+0.20	+0.00	-2.34	-0.03	+0.00	+0.04	-12.49	-10.34	-0.88
1248 - 1410	-0.07	+0.02	+2.81	+0.04	+0.00	-0.08	+23.62	+17.51	+2.28
	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
1410 - 1588	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	+0.56	-0.00	-2.85	-0.07	+0.00	-0.02	-55.42	-52.84	-1.23
	-0.14	+0.95	+4.45	+0.10	+0.00	-0.27	+67.89	+56.02	+3.94



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Conclusions

Back-up

$p_T$ range in GeV	RelativeJEREC2 [%]	RelativeJERHF [%]	RelativePtHB [%]	RelativePtEC1 [%]	RelativePtEC2 [%]	RelativePtHF [%]	RelativeSample [%]	RelativeStatEC [%]	RelativeStatFSR [%]
74 – 97	-2.78	+0.00	+0.14	+0.12	+0.04	+0.00	-0.40	-1.75	-0.21
	+1.42	+0.00	+0.10	-0.17	-0.08	+0.00	+2.44	+0.82	+0.33
97 – 133	-1.00	+0.00	-0.03	+0.02	+0.03	+0.00	-0.19	-0.84	-0.32
	+1.59	+0.00	-0.03	-0.02	-0.01	+0.00	-0.09	+1.28	+0.31
133 – 174	-1.49	+0.00	+0.02	+0.08	-0.00	+0.00	+0.66	-1.45	-0.31
	+1.16	+0.00	+0.01	-0.10	-0.01	+0.00	-0.64	+1.16	+0.21
174 – 220	-0.82	+0.00	-0.00	-0.02	-0.01	+0.00	+1.29	-1.66	-0.38
	+0.73	+0.00	-0.00	+0.07	+0.04	+0.00	-1.72	+1.22	+0.28
220 – 272	-0.86	+0.00	+0.00	-0.05	-0.04	+0.00	+1.69	-1.12	-0.32
	+1.02	+0.00	-0.00	-0.02	+0.01	+0.00	-1.70	+1.40	+0.22
272 – 330	-0.70	+0.00	-0.00	-0.13	-0.00	+0.00	+3.46	-1.71	-0.35
	+0.98	+0.00	-0.00	+0.18	+0.05	+0.00	-2.86	+1.92	+0.39
330 – 395	-0.62	+0.00	+0.00	-0.14	-0.04	+0.00	+3.66	-1.79	-0.34
	+0.47	+0.00	+0.00	+0.13	+0.05	+0.00	-3.68	+1.65	+0.35
395 – 468	-0.49	+0.00	-0.00	-0.26	-0.05	+0.00	+5.67	-2.25	-0.42
	+0.55	+0.00	-0.00	+0.25	+0.04	+0.00	-5.21	+2.59	+0.39
468 – 548	-0.30	+0.00	+0.00	-0.28	-0.03	+0.00	+6.19	-2.60	-0.36
	+0.35	+0.00	-0.00	+0.39	+0.03	+0.00	-6.61	+2.26	+0.45
548 – 638	-0.25	+0.00	-0.00	-0.43	-0.04	+0.00	+9.24	-3.11	-0.46
	+0.25	+0.00	-0.00	+0.32	+0.05	+0.00	-8.21	+3.32	+0.39
638 – 737	-0.17	+0.00	+0.00	-0.51	-0.04	+0.00	+11.40	-3.74	-0.50
	+0.16	+0.00	+0.00	+0.52	+0.03	+0.00	-11.05	+3.65	+0.49
737 – 846	-0.08	+0.00	-0.00	-0.72	-0.01	+0.00	+16.15	-4.57	-0.47
	+0.06	+0.00	-0.00	+0.88	+0.02	+0.00	-14.01	+5.44	+0.63
846 – 967	-0.03	+0.00	-0.00	-1.13	-0.02	+0.00	+19.47	-6.00	-0.90
	+0.08	+0.00	+0.00	+1.10	+0.02	+0.00	-18.14	+4.67	+0.72
967 – 1101	+0.03	+0.00	-0.01	-1.19	+0.02	+0.00	+35.09	-7.61	-0.48
	-0.06	+0.00	-0.02	+1.45	-0.02	+0.00	-23.80	+11.13	+1.03
1101 – 1248	-0.03	+0.00	-0.03	-1.41	-0.02	+0.00	+36.05	-6.95	+0.15
	+0.05	+0.00	+0.04	+1.45	+0.02	+0.00	-32.64	+6.65	+1.34
1248 – 1410	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
1410 – 1588	-0.10	+0.00	-0.06	-2.31	-0.04	+0.00	+1.14	-48.38	-0.87
	+0.16	+0.00	+0.75	+2.63	+0.05	+0.00	+182.11	-20.05	+1.68



$$2.0 < |y| < 2.5$$

Introduction

Building  
blocks

Unfolding

Result

Tables

AK4

AK7

Summary &  
Conclusions

Back-up

$p_T$ range in GeV	RelativeStatHF [%]	SinglePionECAL [%]	SinglePionHCAL [%]	TimePtEta [%]
74 - 97	+0.00	+0.90	+0.32	-1.82
	+0.00	-0.46	-0.16	+3.83
97 - 133	+0.00	+0.33	+0.06	-1.56
	+0.00	-0.42	-0.11	+1.25
133 - 174	+0.00	+0.19	+0.09	-2.24
	+0.00	-0.19	-0.11	+2.54
174 - 220	+0.00	+0.18	+0.03	-2.75
	+0.00	-0.15	-0.00	+1.73
220 - 272	+0.00	-0.08	-0.03	-2.18
	+0.00	+0.02	-0.03	+2.66
272 - 330	+0.00	-0.06	-0.01	-3.06
	+0.00	+0.13	+0.02	+3.12
330 - 395	+0.00	-0.14	-0.14	-3.01
	+0.00	+0.11	+0.14	+2.95
395 - 468	+0.00	-0.25	-0.09	-3.63
	+0.00	+0.27	+0.08	+3.93
468 - 548	+0.00	-0.28	-0.21	-3.86
	+0.00	+0.36	+0.28	+3.55
548 - 638	+0.00	-0.50	-0.25	-4.26
	+0.00	+0.44	+0.21	+4.60
638 - 737	+0.00	-0.50	-0.24	-4.89
	+0.00	+0.49	+0.22	+4.73
737 - 846	+0.00	-0.67	-0.41	-5.32
	+0.00	+0.84	+0.48	+6.33
846 - 967	+0.00	-1.07	-0.56	-6.28
	+0.00	+1.01	+0.54	+5.33
967 - 1101	+0.00	-1.45	-0.75	-7.10
	+0.00	+1.53	+0.96	+10.39
1101 - 1248	+0.00	-0.18	+0.39	-7.26
	+0.00	+1.53	+1.42	+8.61
1248 - 1410	+0.00	+0.00	+0.00	+0.00
	+0.00	+0.00	+0.00	+0.00
1410 - 1588	+0.00	-1.21	-0.58	-49.63
	+0.00	+4.02	+2.05	-20.03



# Summary & Conclusions.

## Summary & Conclusions

- Unfolding with MC samples is basically set up for both AK4 & AK7.
- Standard requirements from statistical committee should be met.
- Refine treatment of miss and fake.
- Finally, investigate smoothness (with Chebyshev & QCD fits).

→ QCD fits will start again very soon...

# Thank you for your attention!



Back-up.

- AK4** anti  $k_T$  algorithm ( $R = 0.4$ ). 8, 69
- AK7** anti  $k_T$  algorithm ( $R = 0.7$ ). 4, 8, 69
- AN** Analysis Note. 15
- BLT** Bottom Line Test. 3
- CT** Closure Test. 3
- MC** Monte Carlo. 3, 69
- QCD** Quantum Chromodynamics. 3, 15, 69



# References I

