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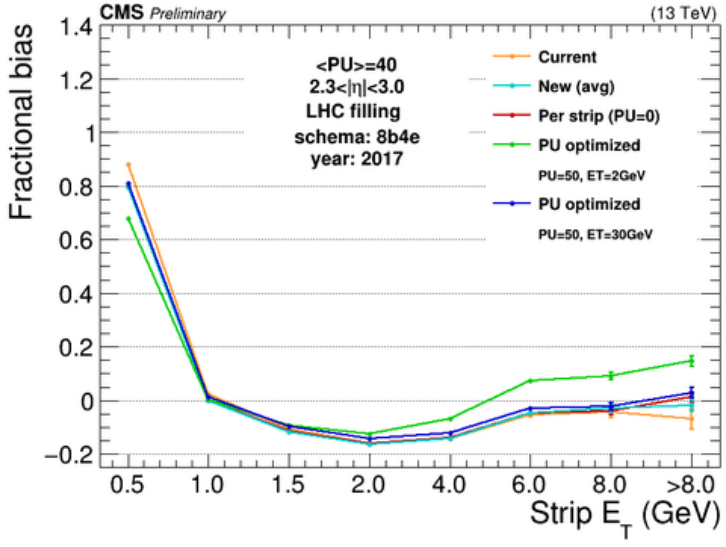
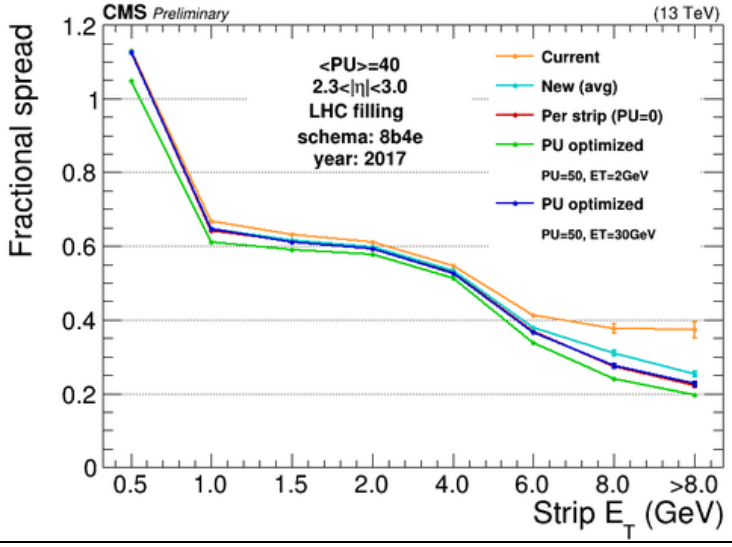
CMS-DP-2019/040

CMS ECAL Trigger

Abstract: CMS ECAL Trigger plots.

CDS entry

iCMS entry

Figure	Caption
pdf version  pdf version  	The plots show the amplitude bias and resolution for different sets of amplitude weights versus signal ET by strip The fractional bias is defined as: (online/offline - 1) The fractional spread is defined as: 𝜎(online/offline - 1) / (online/offline) Error on the points: error on the mean of the bias and error on the spread of the bias Dataset: Full-Readout ZeroBias data from November 2017 with PU=40 with the 8b4e filling scheme (8 colliding bunch trains separated by 4 empty bunches) for TPs with abs( ) > 2.3 There is a strong ET dependence to the amplitude bias and resolution. It is more striking for low energy (< 2 GeV) TPs (by strip) There are significant improvements observed when updating from the current weights, especially at the lowest ET values. PU optimised weights perform the best in term of resolution for all energies.

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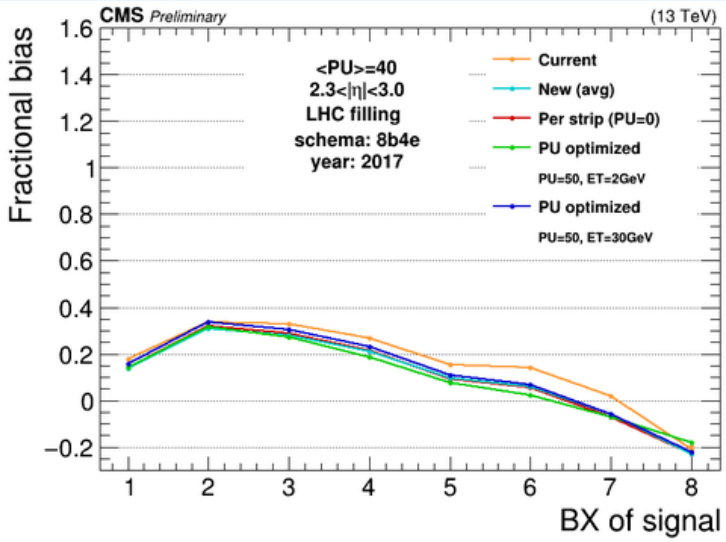

The plots show the amplitude bias and resolution for different sets of amplitude weights versus bunch crossing (BX) position in LHC train.

The fractional bias is defined as: (online/offline - 1)

The fractional spread is defined as: 𝜎(online/offline - 1) / (online/offline)

Error on the points: error on the mean of the bias and error on the spread of the bias

Dataset: Full-Readout ZeroBias data from November 2017 with PU=40 with 8b4e filling scheme (8 colliding bunch trains separated by 4 empty bunches) for TPs with abs( )> 2.3

There is a strong bunch position dependence to the amplitude bias

There are significant improvements observed when updating from the current weights, especially in terms of flatness in the response along the LHC train

PU optimised weights perform the best in term of resolution.

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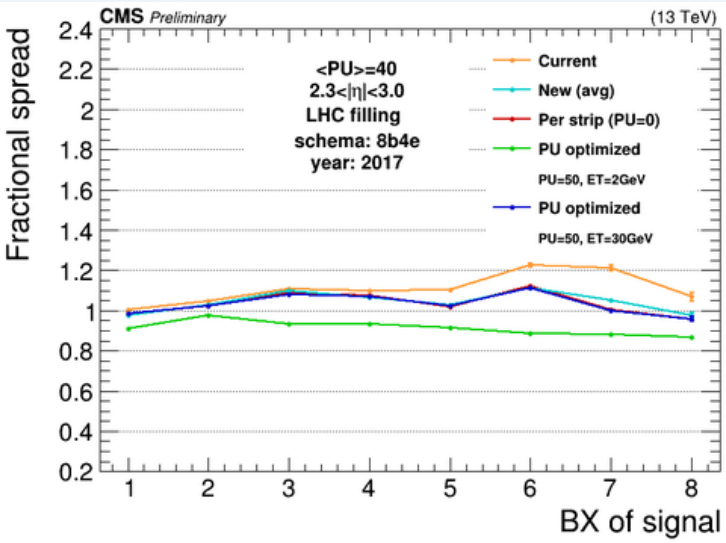

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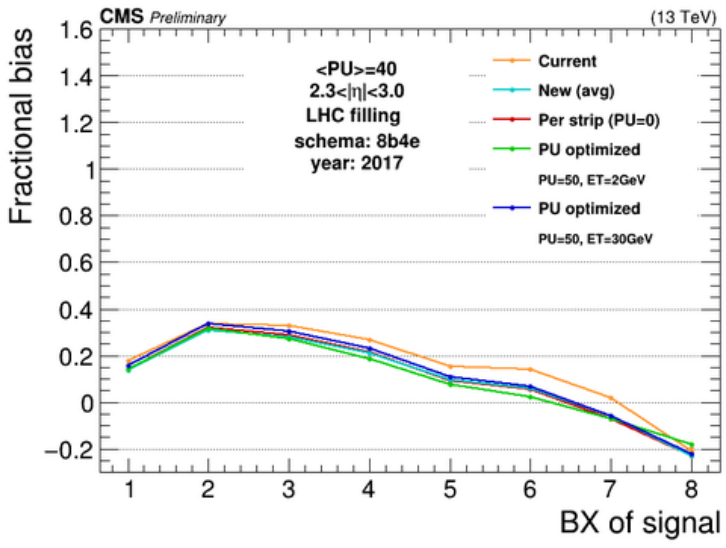

Fractional TP Amplitude bias versus position in LHC bunch train

for 2017 data and simulation, with 8b4e filling scheme (8 colliding bunch trains separated by 4 empty bunches) for TPs with abs( ) > 2.3

Data: Full-Readout ZeroBias data from November 2017 with PU=40

Standalone MC: Simulated signals with same TP ET spectrum and BX distribution as data, with PU=40

Mean TP energy by strip : 1 GeV

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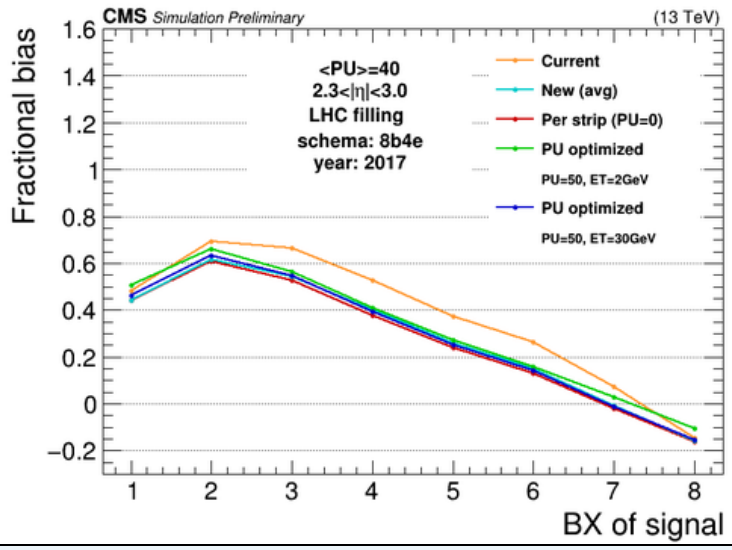
The plots show the amplitude bias for different sets of amplitude weights:



The fractional bias is defined as:

data: (online/offline - 1)

Standalone MC: (reconstructed/true -1)

There is a strong bunch position dependence to the amplitude bias, seen in both data and simulation with the same trend

There are significant improvements observed when updating from the current weights

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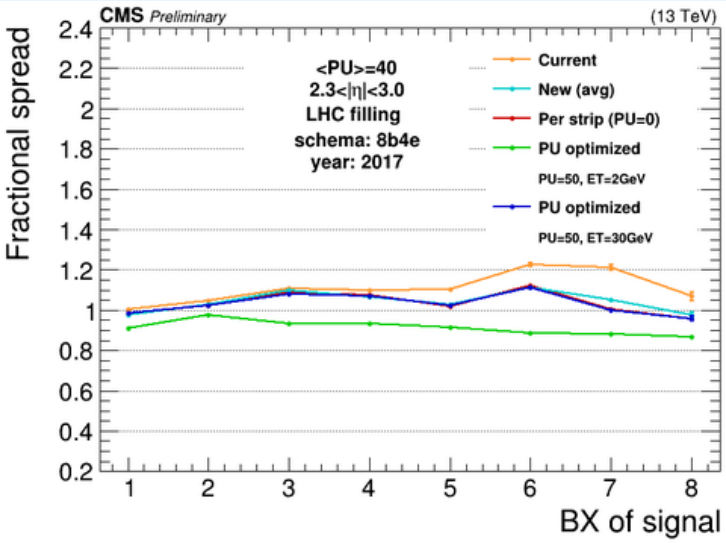

Spread in TP Amplitude spread versus position in LHC bunch train

for 2017 data and simulation, with 8b4e filling scheme (8 colliding bunch trains separated by 4 empty bunches) for TPs with abs( ) > 2.3

Data: Full-Readout ZeroBias data from November 2017 with PU=40

Standalone MC: Simulated signals with same TP ET spectrum and BX distribution as data, with PU=40

Mean TP energy by strip : 1 GeV

The fractional spread is defined as:

data: 𝜎(online/offline - 1) / (online/offline)

Standalone MC: 𝜎(reconstructed/true -1) / (reconstructed/true)

There is a strong bunch position dependence to the spread, seen in both data and simulation with the same trend.

The spread, or resolution of the TPs, improves when the weights are updated

PU-optimised weights perform best, removing the bunch crossing dependence, for both data and standalone MC

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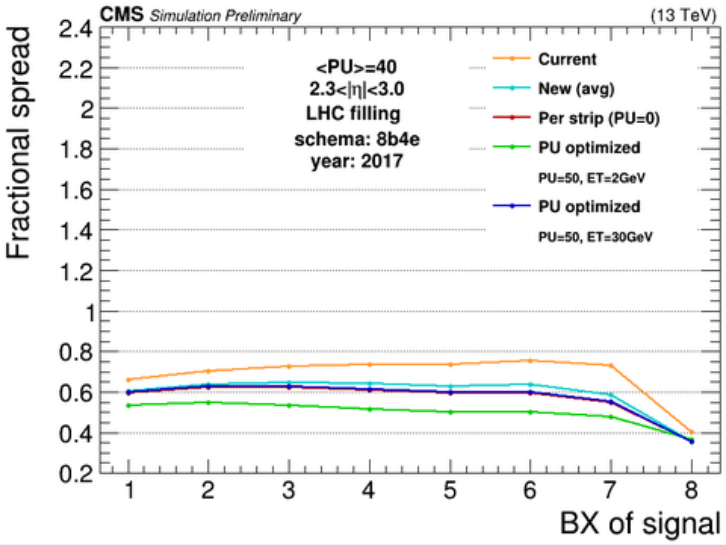

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