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FCC-ee Progress Overview

Forward-Backward Asymmetry

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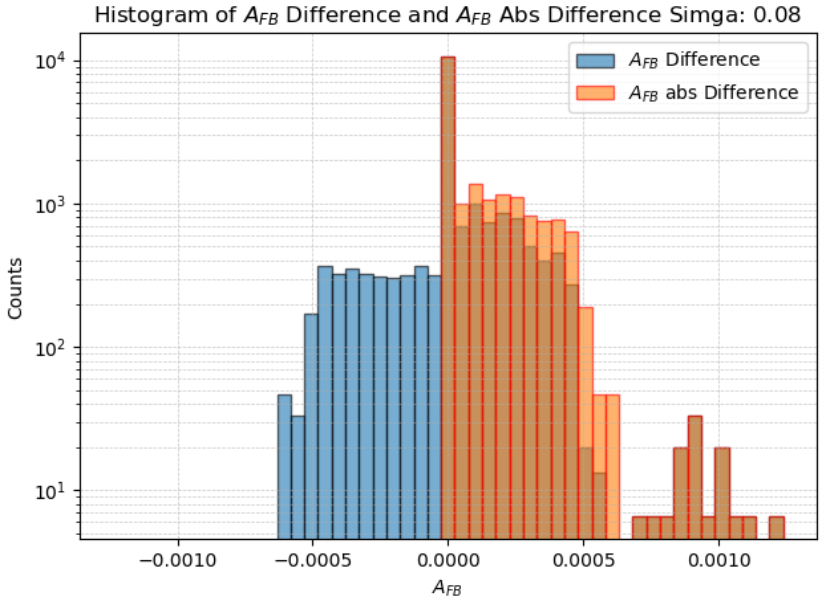
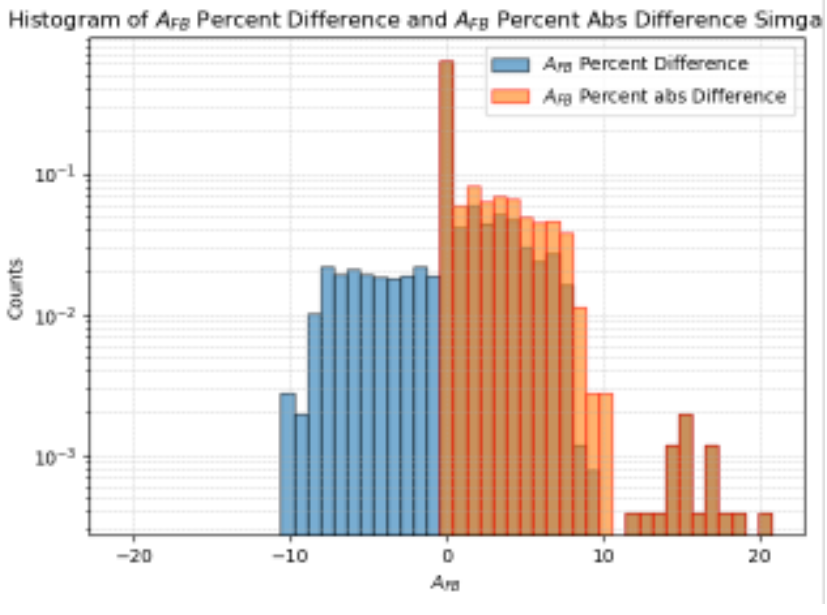
Calculating the A_{FB} Values

1. Pick 2 Muons
2. Based on ϕ values pick 1 muon
3. Pick a cut value off a Gaussian distribution
4. Select the muon based off the cut
5. The other muon stays the same
6. Fill histogram and fit the values

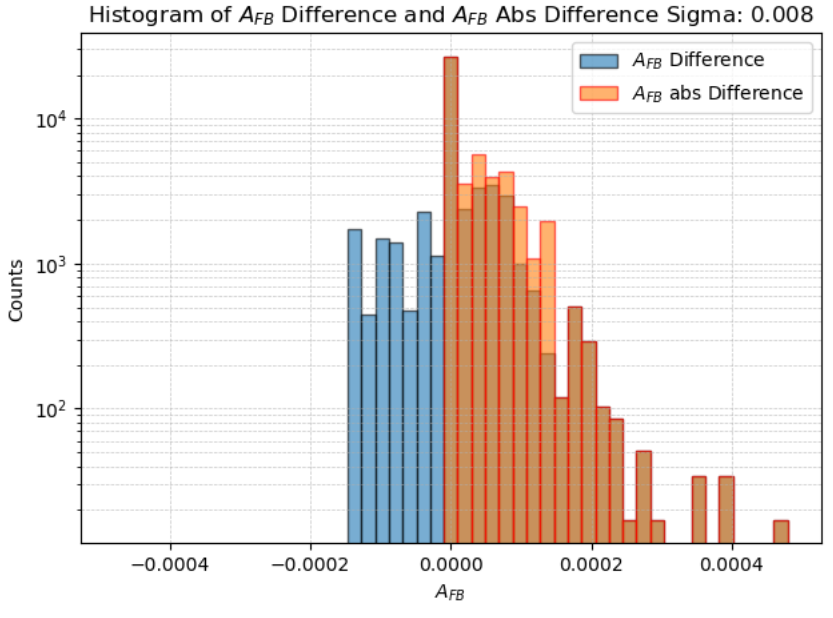
$$\frac{d\sigma(s)}{dcos(\theta_c)} = \sigma(s) \times (\frac{3}{8}(1 + cos^2(\theta_c)) + A_{FB}(s)cos(\theta_c))$$

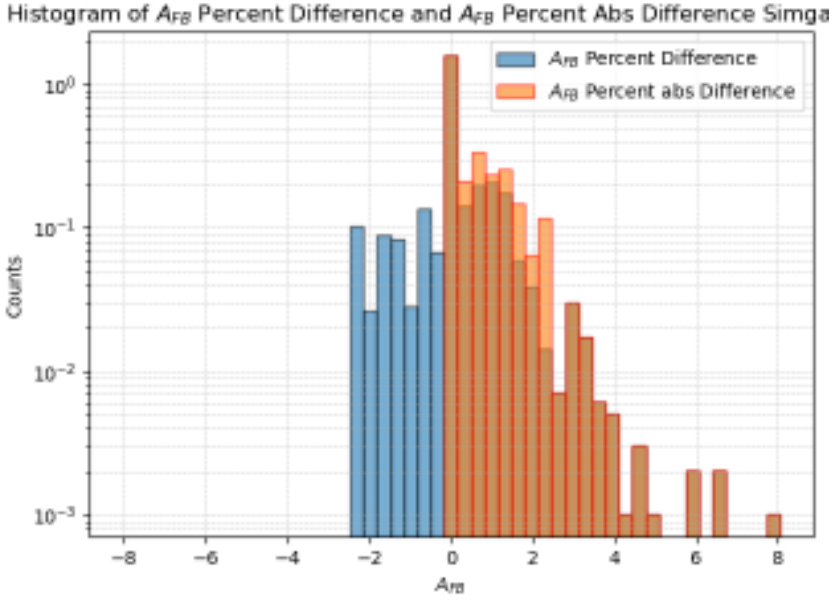
$\sigma = 0.08$


Histogram of A_{FB} Difference and A_{FB} Abs Difference Simga: 0.08
A_{FB} Difference
A_{FB} abs Difference
Counts
10^4
10^3
10^2
10^1
−0.0010
−0.0005
0.0000
0.0005
0.0010
A_{FB}


Histogram of A_{FB} Percent Difference and A_{FB} Percent Abs Difference Simga
A_{FB} Percent Difference
A_{FB} Percent abs Difference
Counts
10^{-1}
10^{-2}
10^{-3}
−20
−10
0
10
20
A_{FB}

$\sigma = 0.008$


Histogram of A_{FB} Difference and A_{FB} Abs Difference Sigma: 0.008
A_{FB} Difference
A_{FB} abs Difference
Counts
10^4
10^3
10^2
−0.0004
−0.0002
0.0000
0.0002
0.0004
A_{FB}


Histogram of A_{FB} Percent Difference and A_{FB} Percent Abs Difference Simga
A_{FB} Percent Difference
A_{FB} Percent abs Difference
Counts
10^0
10^{-1}
10^{-2}
10^{-3}
−8
−6
−4
−2
0
2
4
6
8
A_{FB}

Whats Next?

1. Try different Sigma values
2. Scan the code again to make sure there is no bias towards anywhere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