

Optics Status Update

Chao Gu

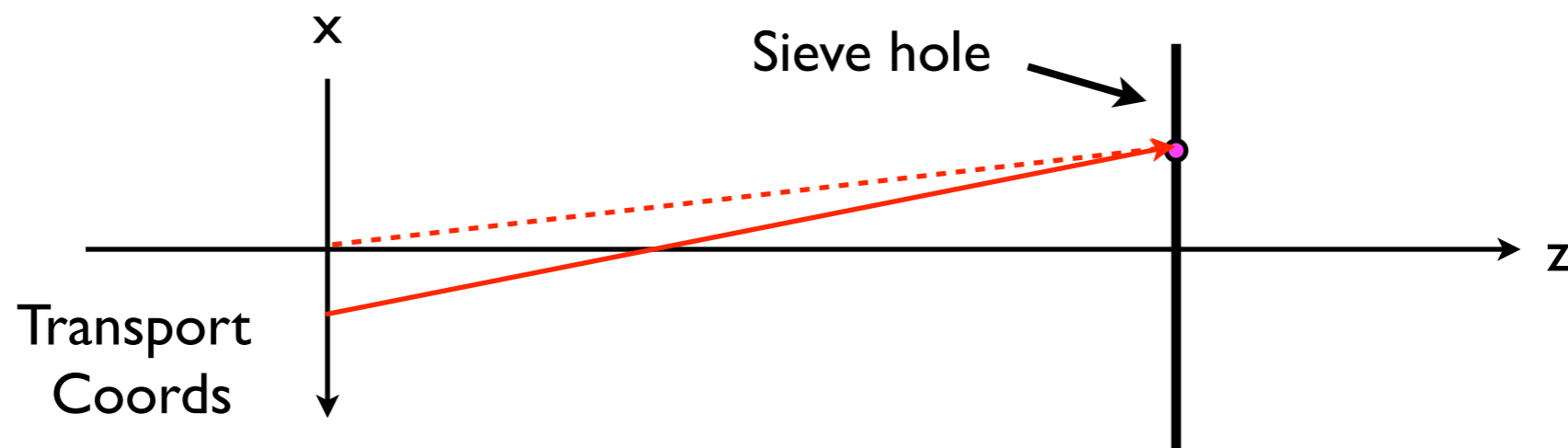
Calibration Status

- Compare the reconstruction matrix elements between different settings
- If the elements agrees within errors, it gives a proof that we treat the target field correctly (The agreement is a necessary but not sufficient condition)

Calibration

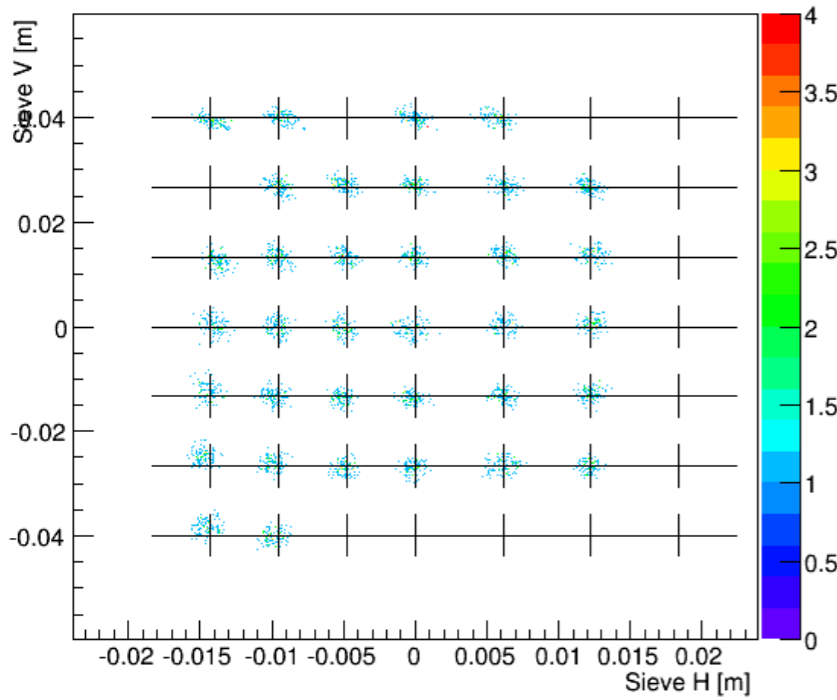
- Offset and correction:
 - The constant term of the matrix comes from the method we decide the reference angle
 - When using multiple runs, need to correct the reference angle with beam position information

$$\theta_{\text{rec}} = \theta_{\text{matrix}} + x_{\text{tg}} \times C_{\theta} \qquad \delta_{\text{rec}} = \delta_{\text{matrix}} + \frac{x_{\text{tg}}}{C_{\delta}}$$
$$\varphi_{\text{rec}} = \varphi_{\text{matrix}} + y_{\text{tg}} \times C_{\varphi}$$

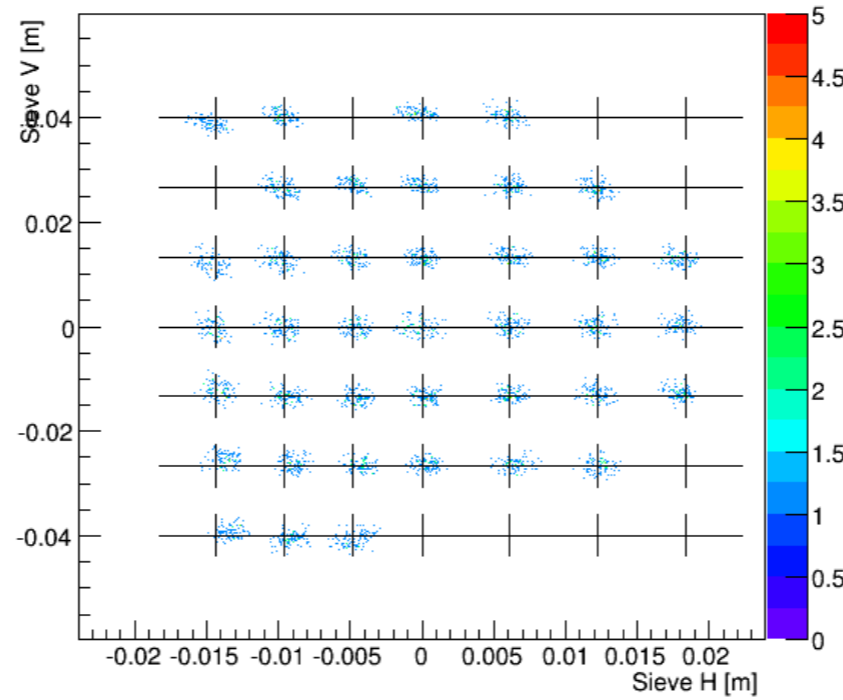


Calibration

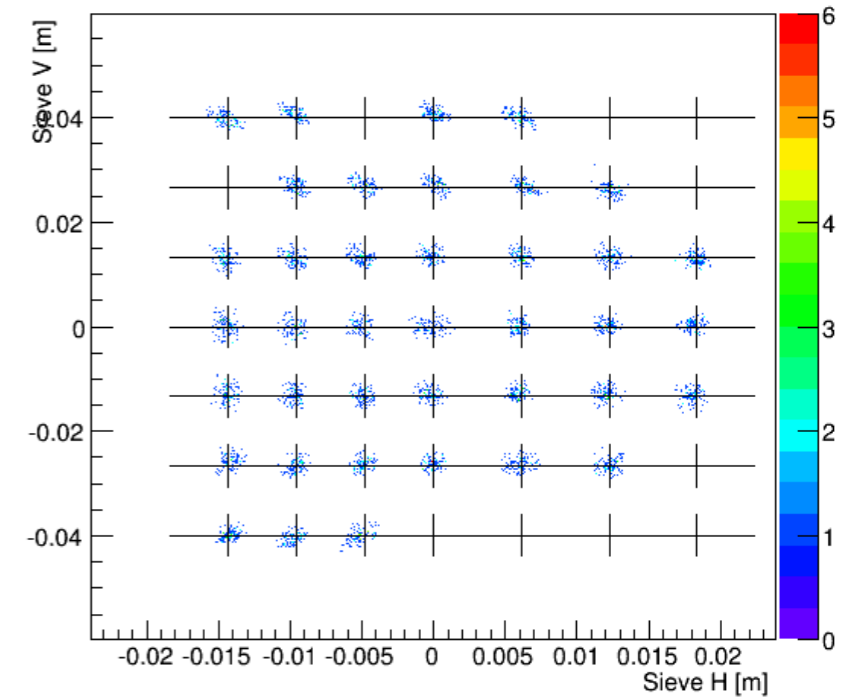
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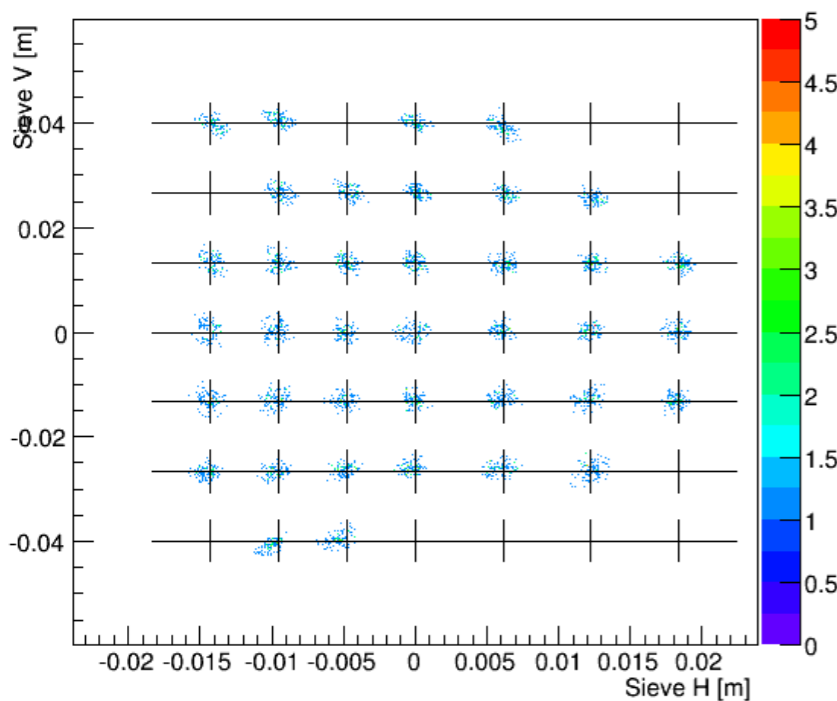
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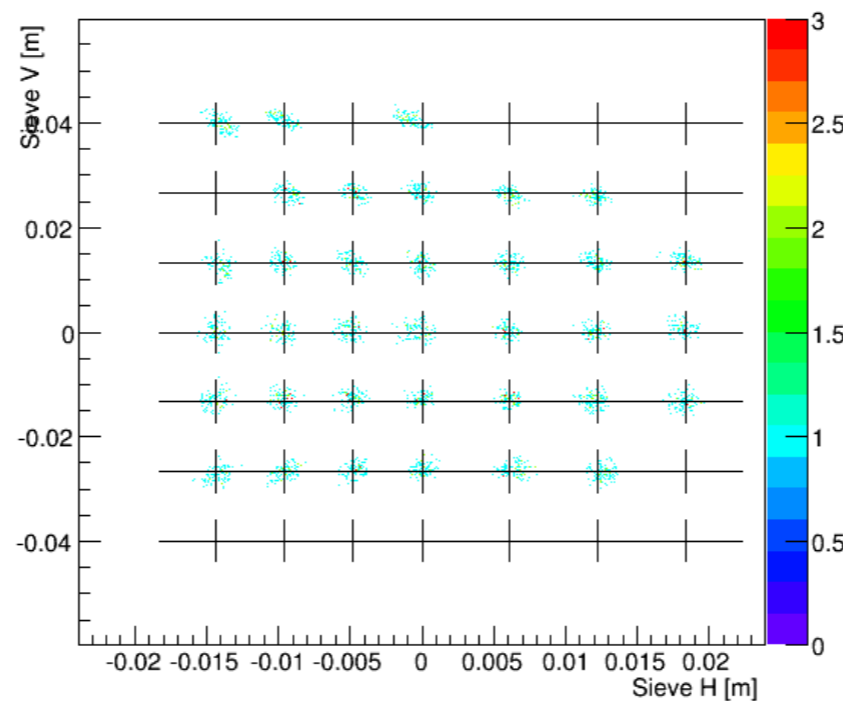
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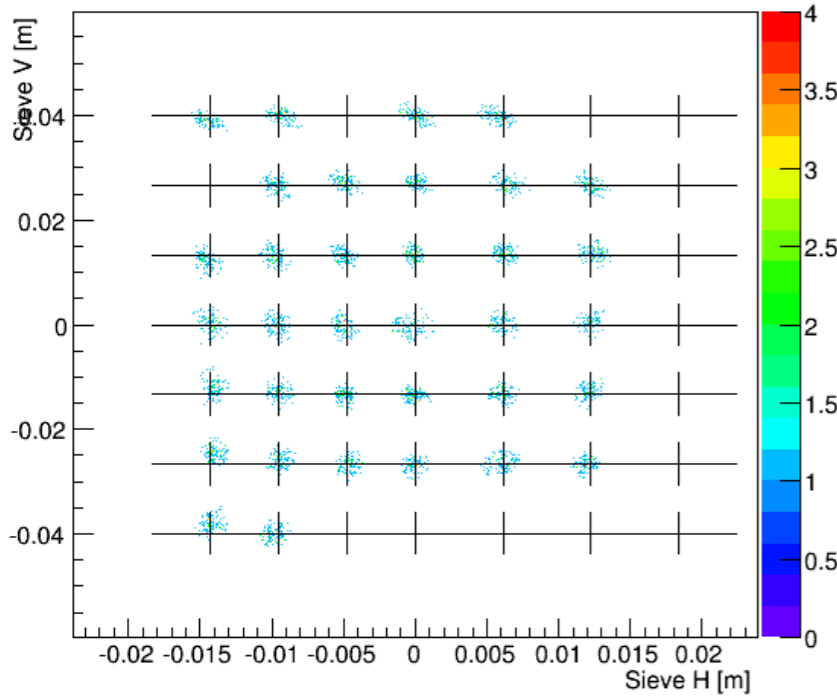
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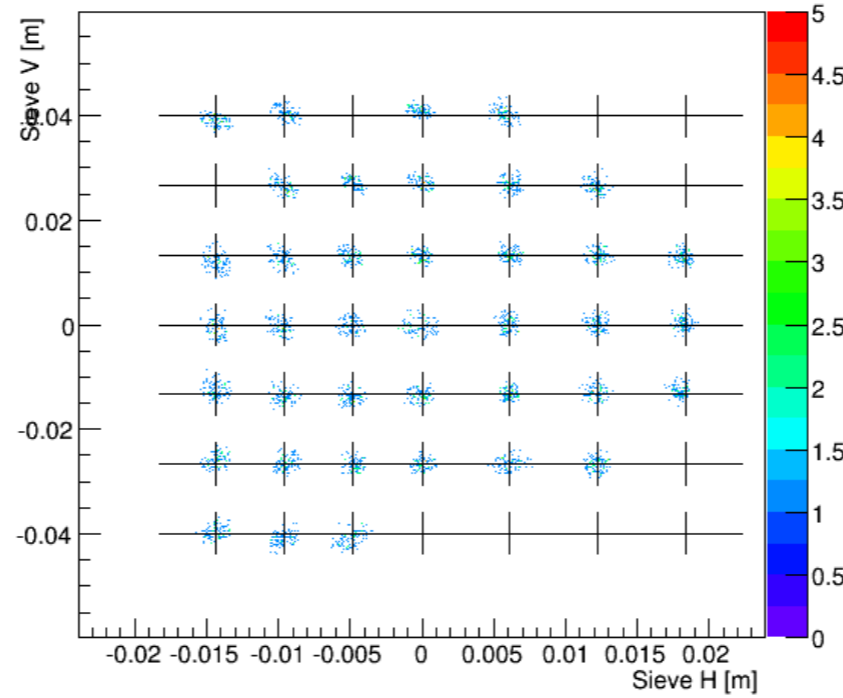
- 2.254GeV, Longitudinal
- Without correction
- RMS (mrad):
 - theta: 1.473
 - phi: 0.733

Calibration

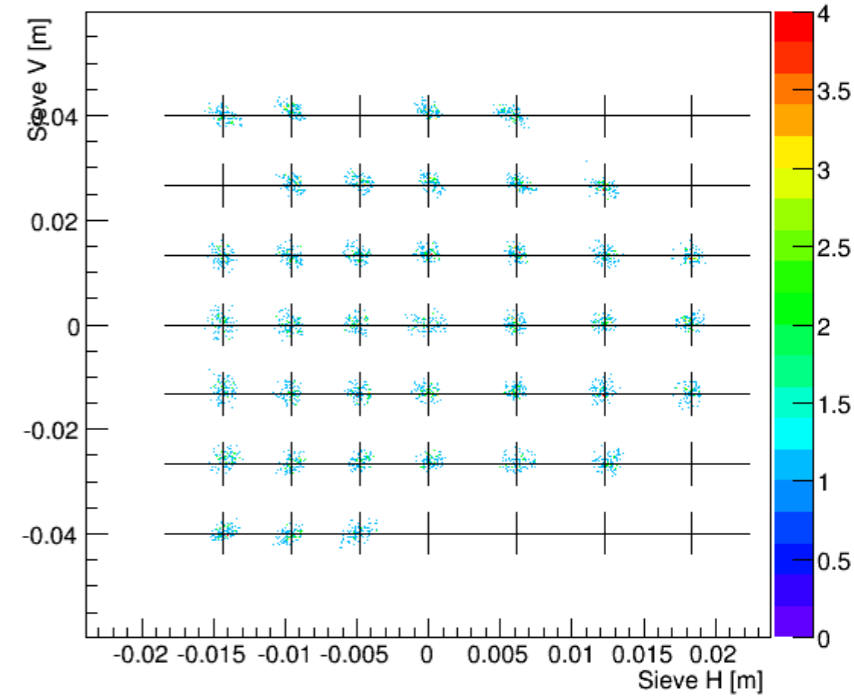
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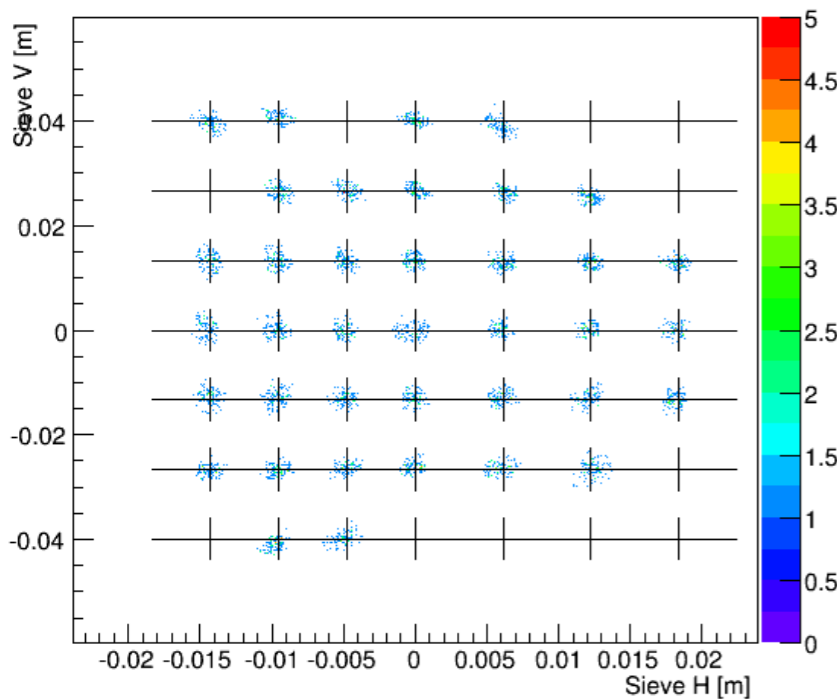
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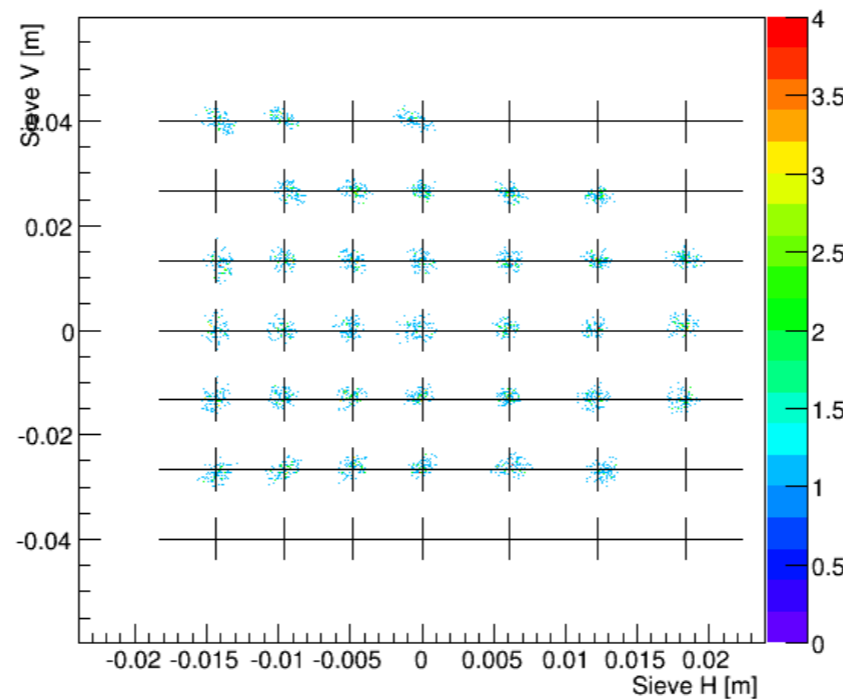
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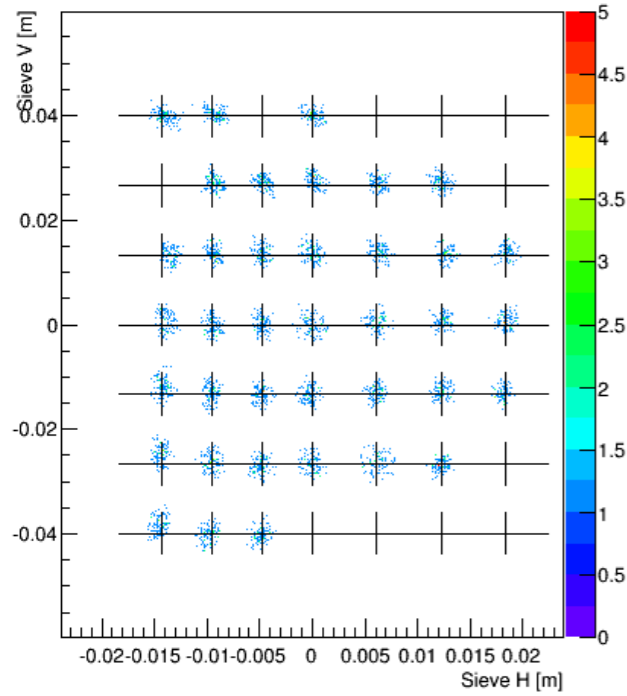
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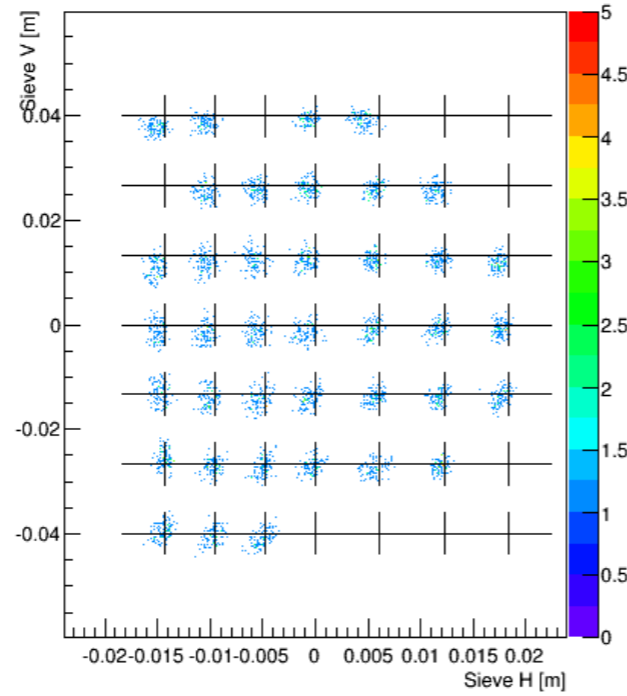
- 2.254GeV, Longitudinal
- With correction
- RMS (mrad):
 - theta: 1.500
 - phi: 0.632

Calibration

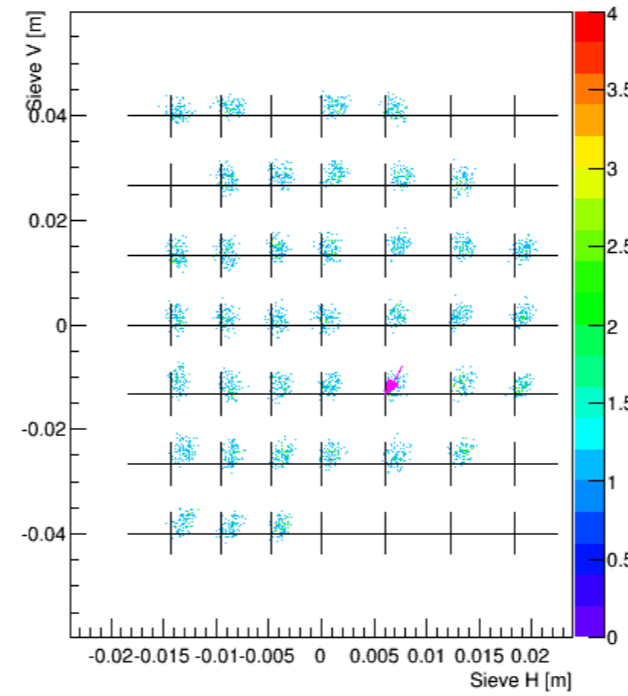
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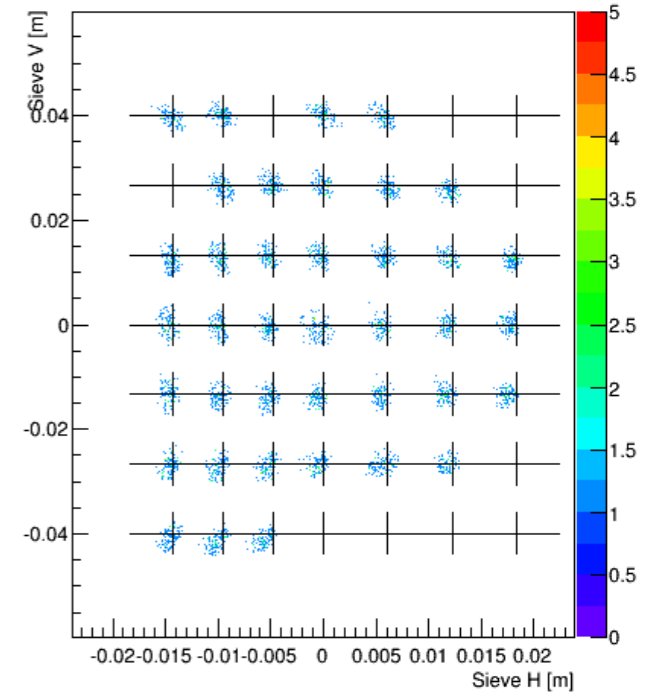
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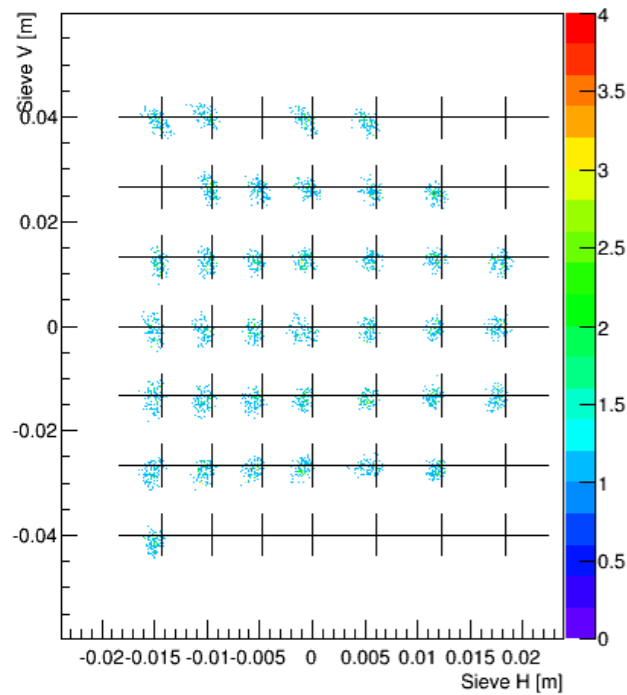
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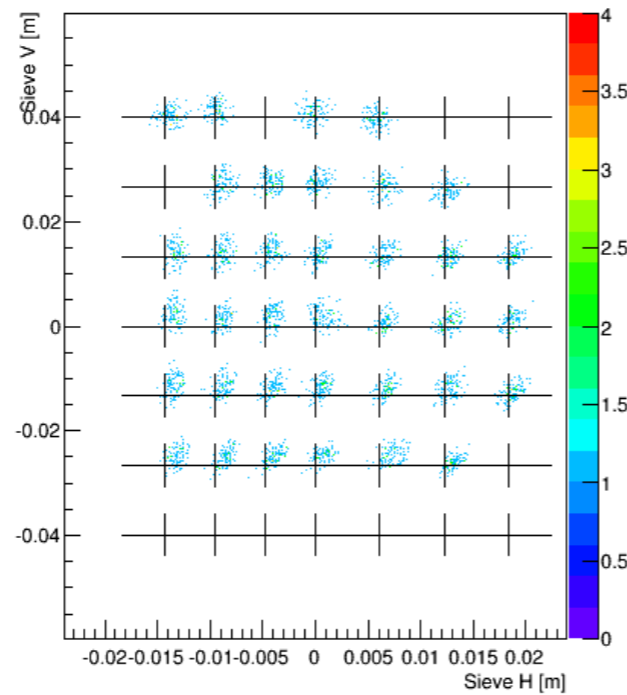
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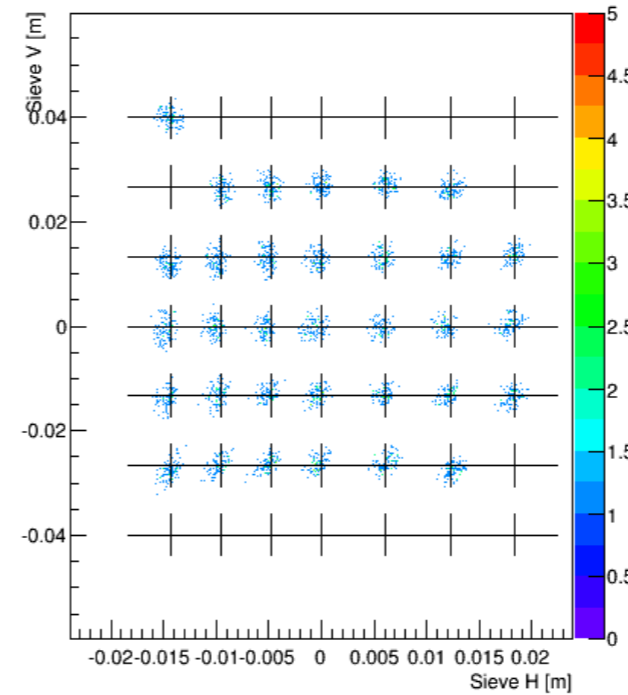
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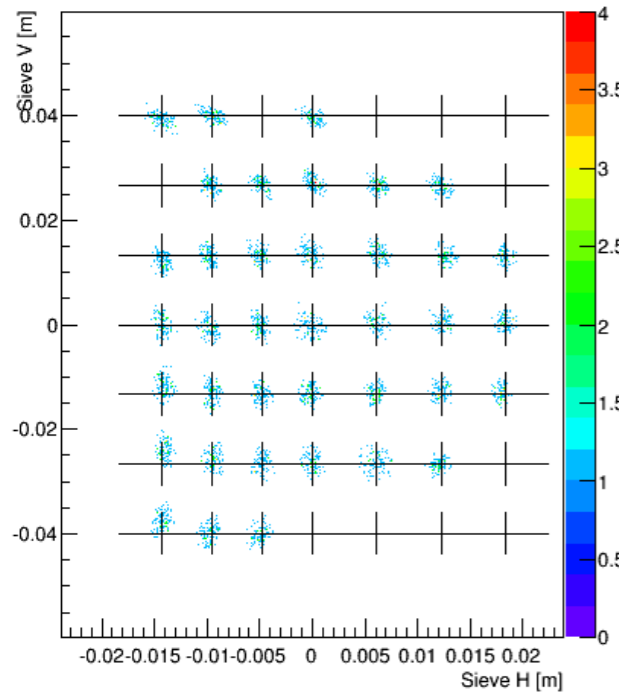
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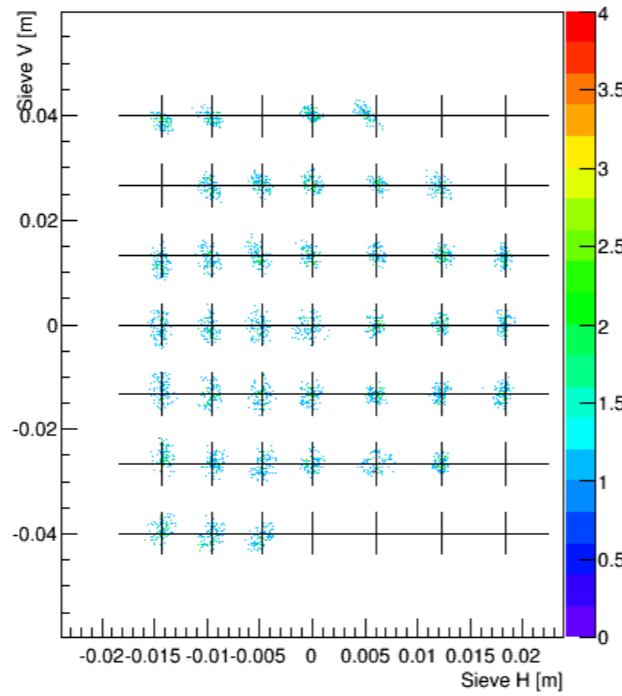
- 1.706GeV
- Without correction
- RMS (mrad):
 - theta: 2.109
 - phi: 1.052

Calibration

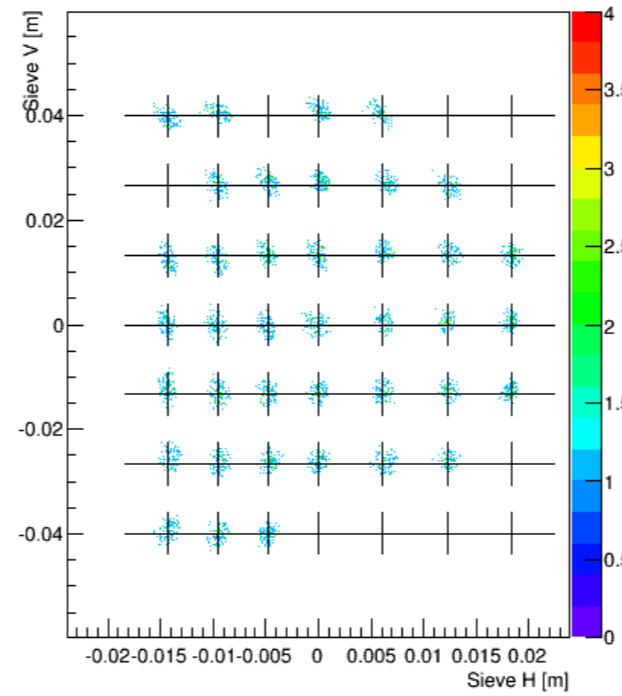
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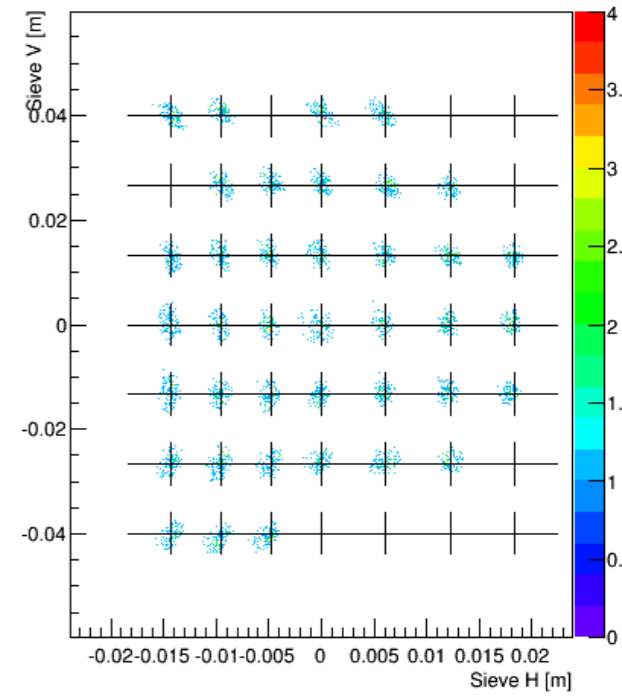
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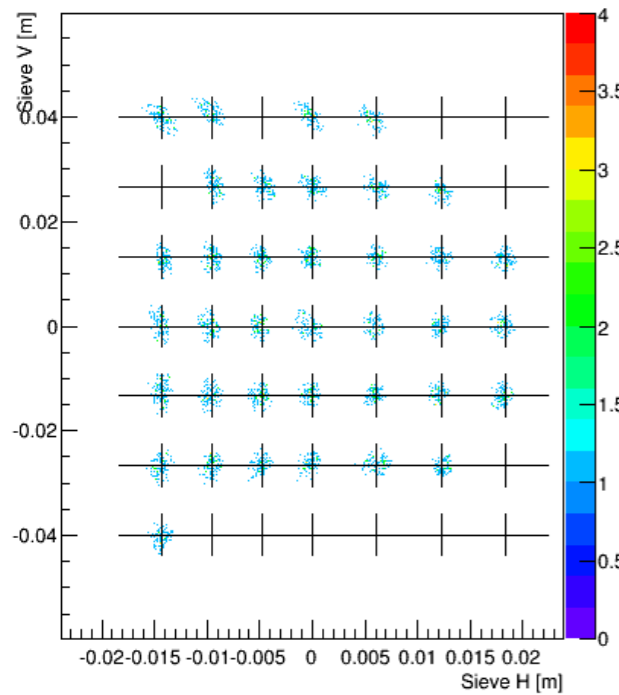
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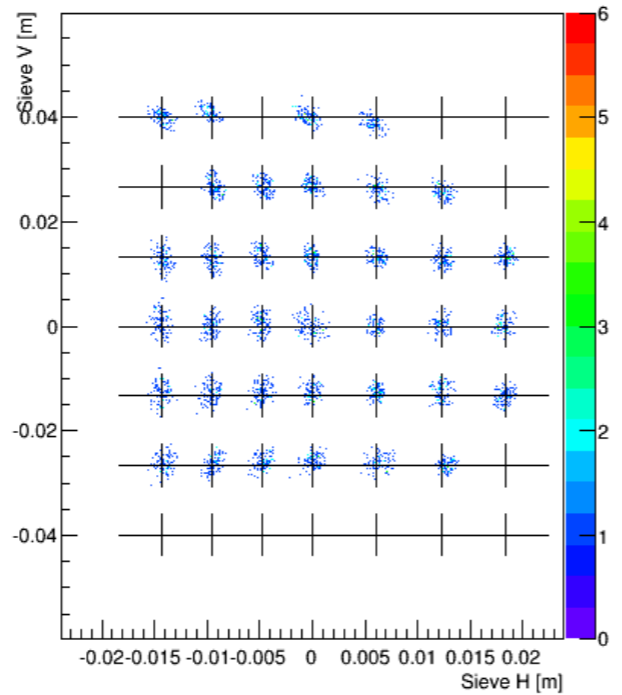
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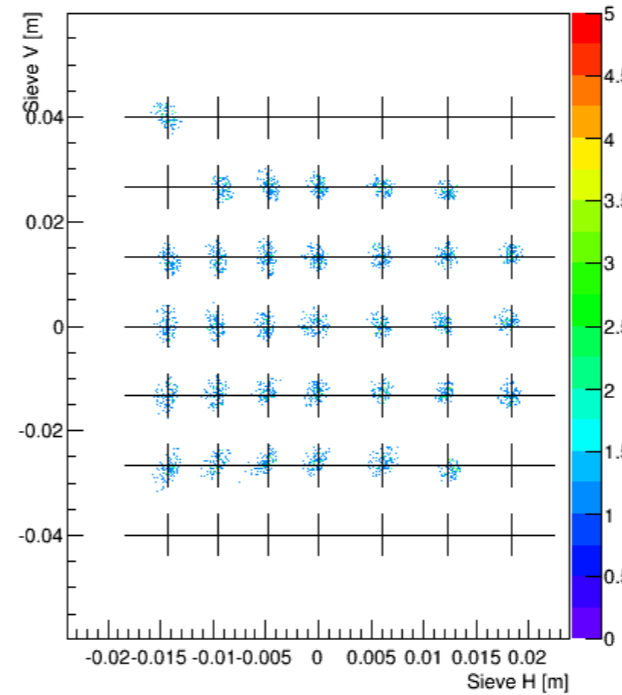
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- 1.706GeV
- With correction
- RMS (mrad):
 - theta: 1.731
 - phi: 0.676

Calibration

Before Correction

E/GeV	Field	T0000	T1000	T0100	T0010	T0001
2.254	L	7.972E-03	2.187E-02	-2.748E+00	-4.315E-02	3.180E-01
1.706	2.5T	1.218E-02	2.767E-02	-2.814E+00	1.762E-02	2.465E-01
		P0000	P1000	P0100	P0010	P0001
2.254	L	-4.848E-03	1.351E-02	1.868E-01	-7.045E-01	3.766E-01
1.706	2.5T	-6.936E-03	1.044E-02	2.255E-01	-7.149E-01	3.895E-01
		D0000	D1000	D0100	D0010	D0001
2.254	L	1.936E-03	7.410E-02	-2.934E-02	-1.147E-02	6.727E-02
1.706	2.5T	9.021E-04	7.415E-02	-2.876E-02	7.884E-03	3.523E-02

Calibration

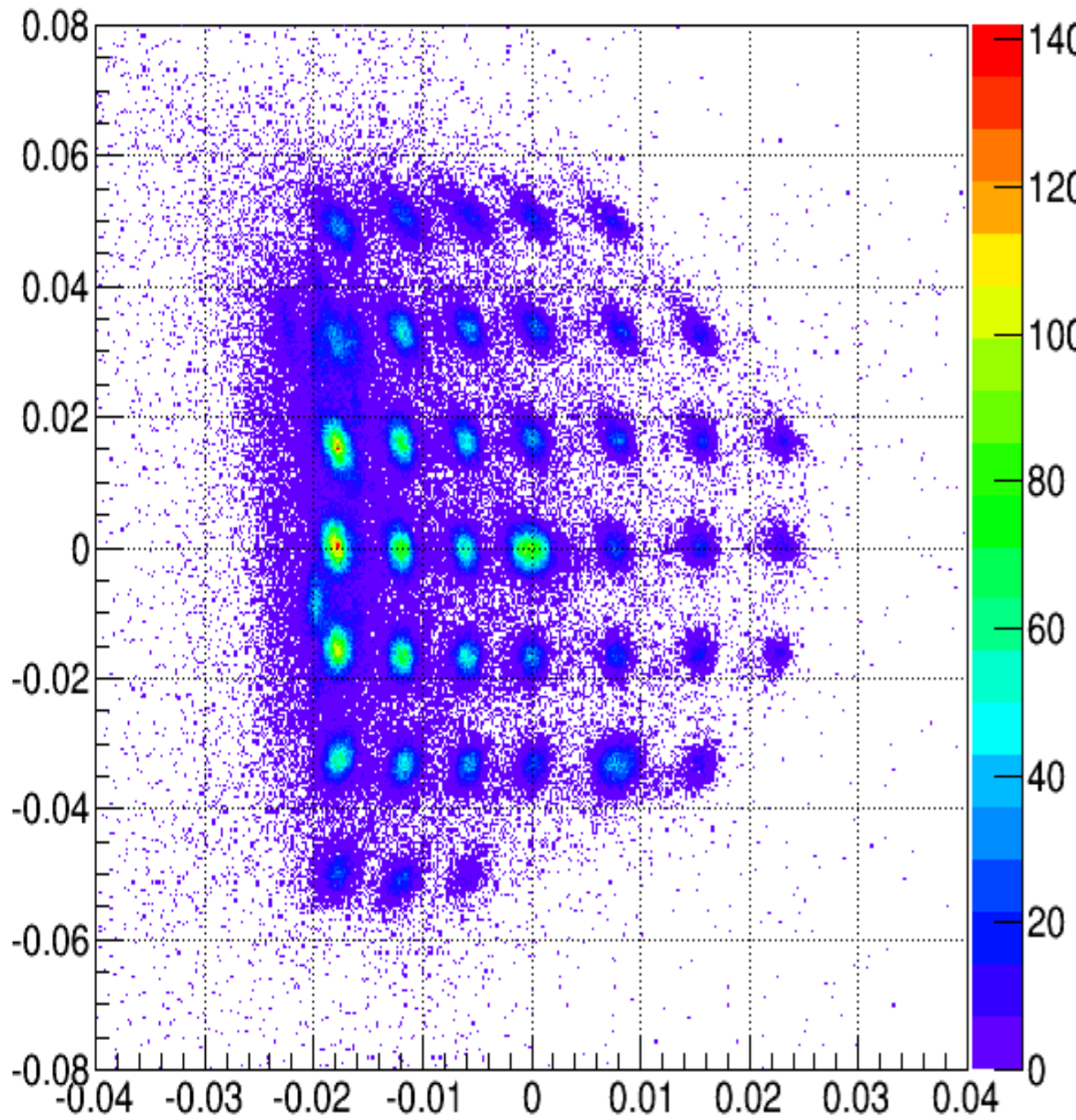
After Correction

E/GeV	Field	T0000	T1000	T0100	T0010	T0001
2.254	L	1.157E-02	1.993E-02	-2.805E+00	-7.459E-03	3.764E-01
1.706	2.5T	1.091E-02	2.093E-02	-2.858E+00	-8.634E-03	2.917E-01
		P0000	P1000	P0100	P0010	P0001
2.254	L	-2.437E-03	3.260E-03	1.983E-01	-7.104E-01	3.731E-01
1.706	2.5T	-2.426E-03	4.650E-03	2.460E-01	-7.128E-01	3.708E-01
		D0000	D1000	D0100	D0010	D0001
2.254	L	1.340E-03	7.447E-02	-2.443E-02	-1.283E-02	6.918E-02
1.706	2.5T	9.524E-04	7.498E-02	-2.446E-02	6.858E-03	4.086E-02

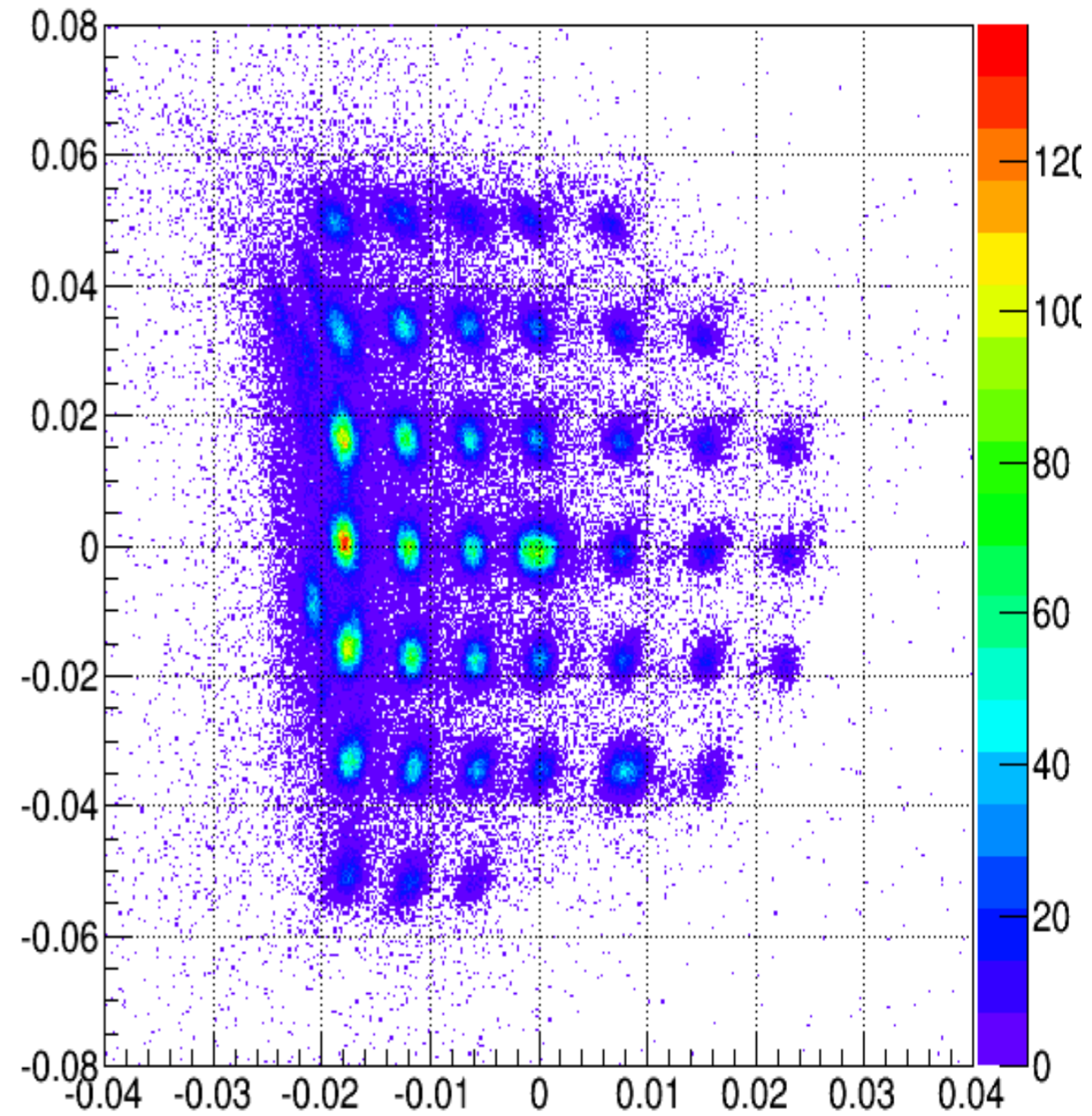
After Correction, the 2 matrix can be used to replay the same run

Calibration

Run 5585 (use longitudinal matrix)



Run 5585 (use 2.5T-field matrix)



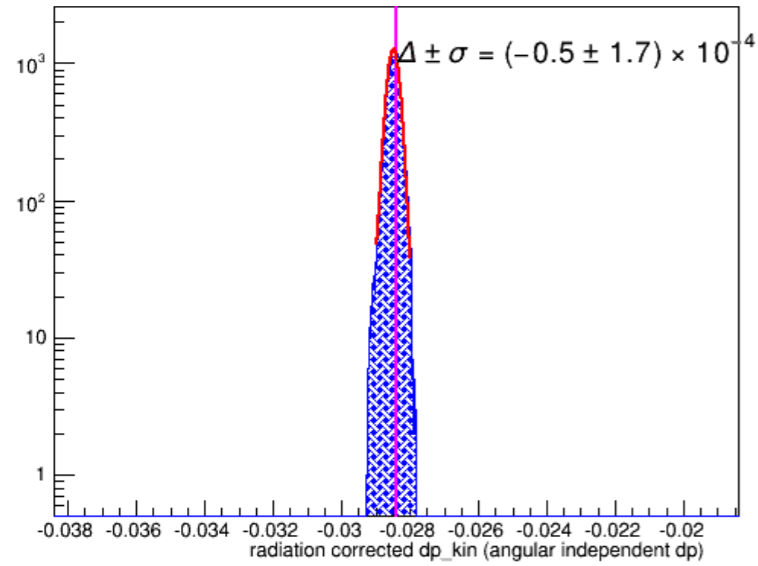
Status

- TODO:
 - Use the new matrix to replay LHRS data
 - Any suggestions from this meeting

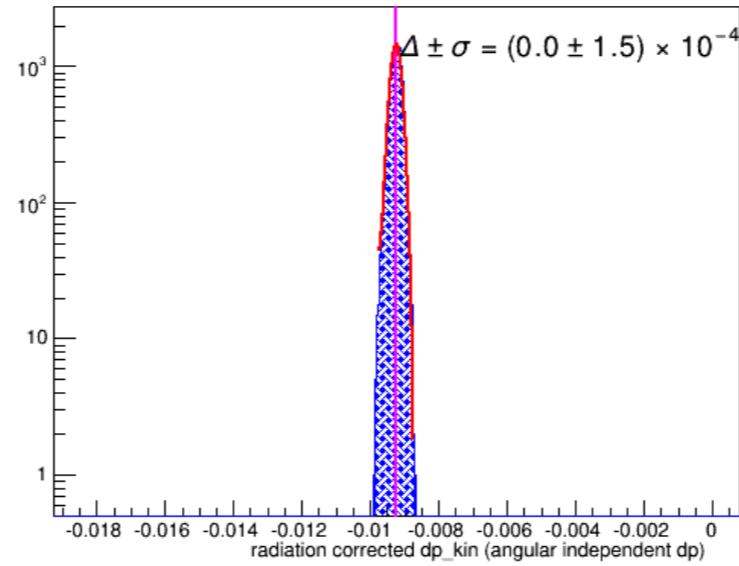
Backups

Calibration

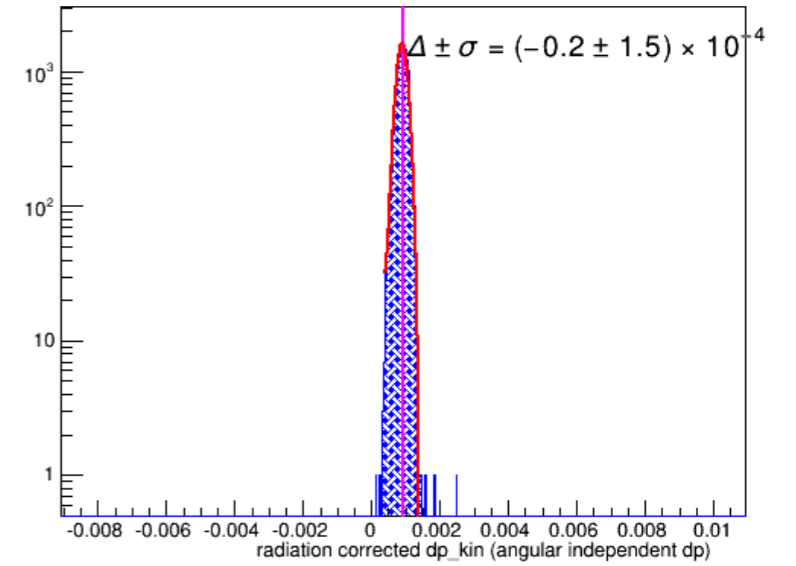
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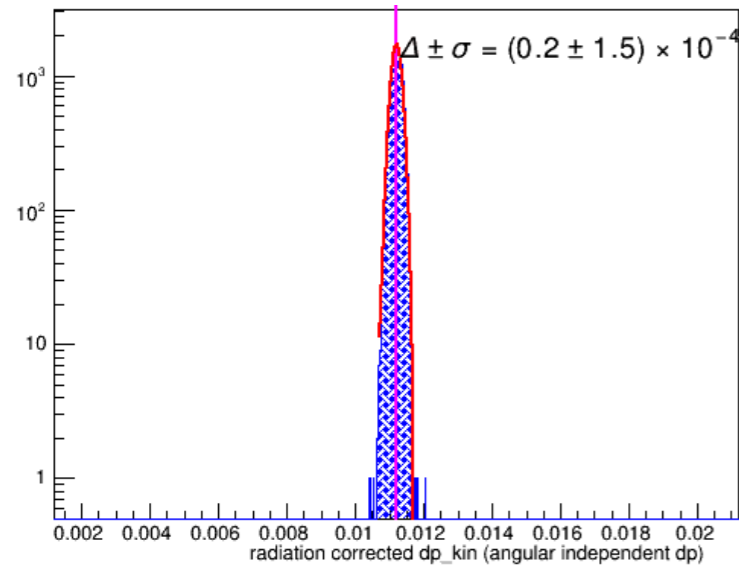
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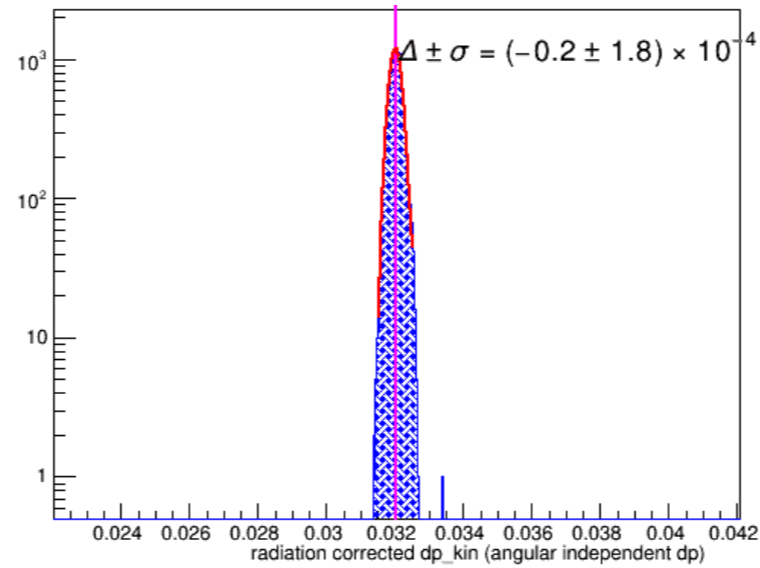
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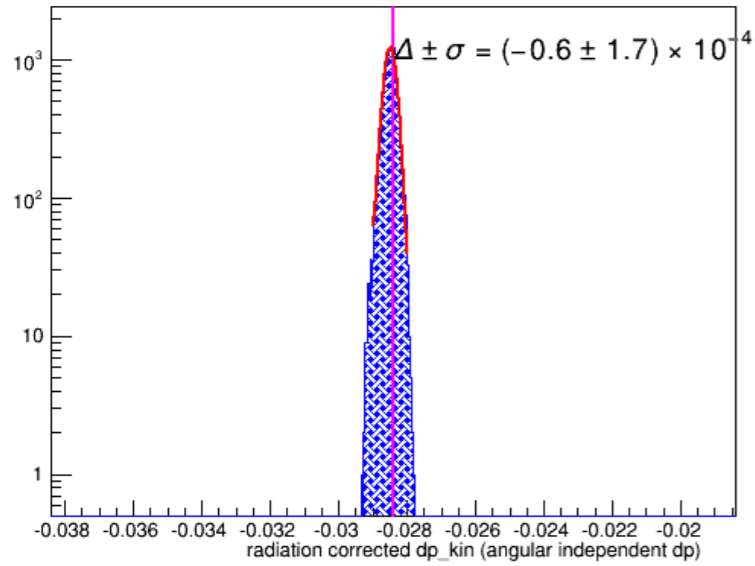
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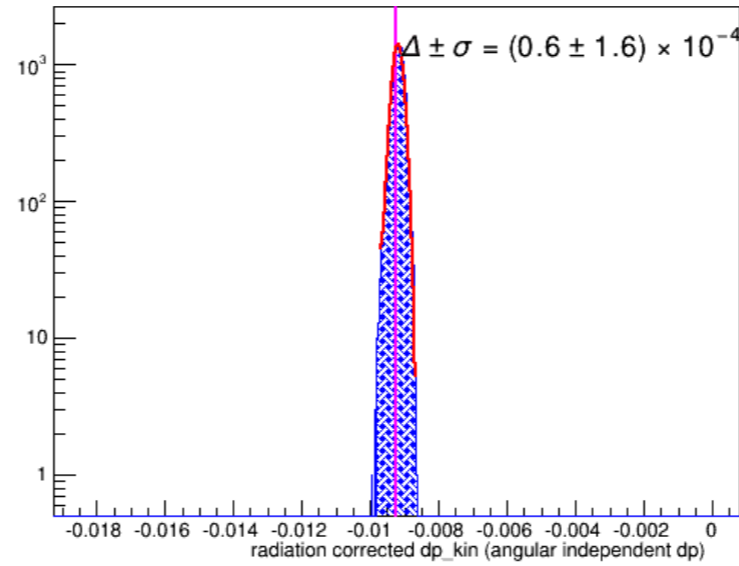
- Without correction
- RMS ($\times 10^{-4}$):
- delta: 1.740

Calibration

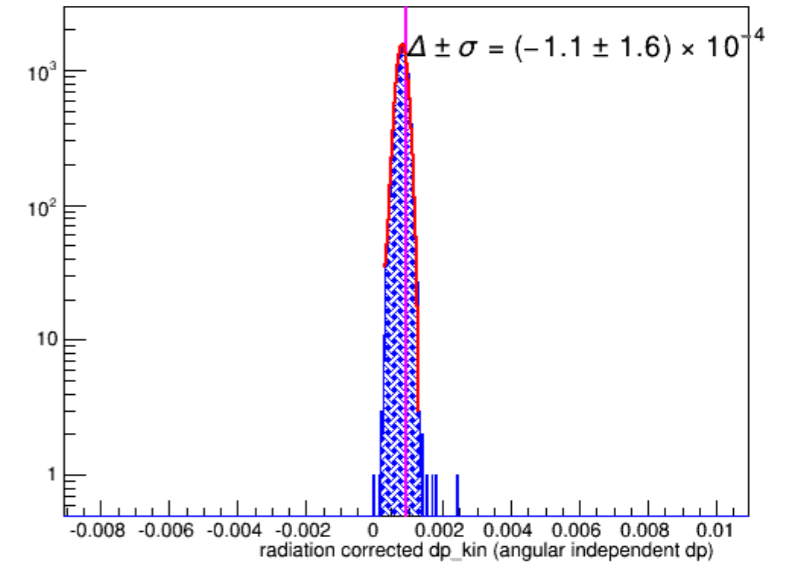
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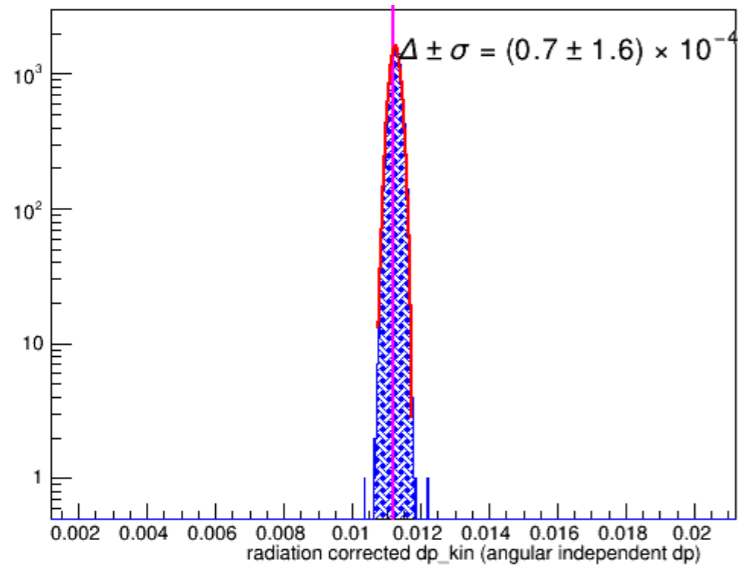
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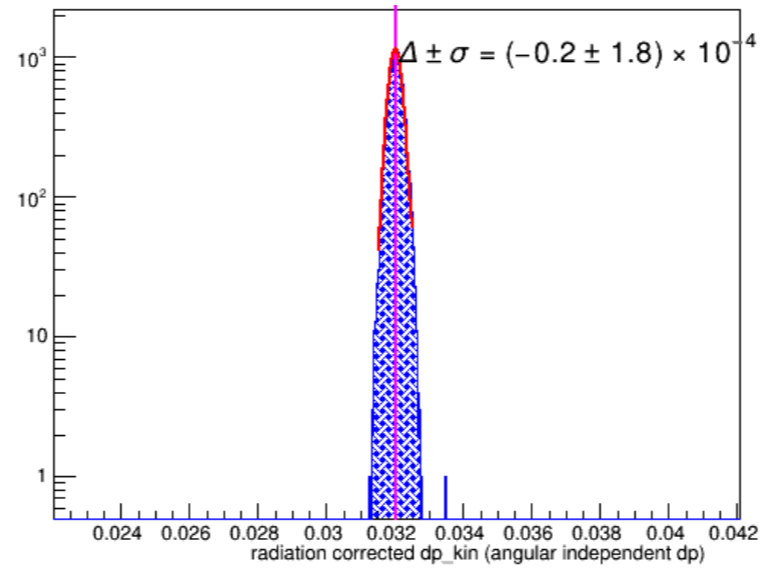
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- With correction
- RMS ($\times 10^{-4}$):
- delta: 1.900