BHCal Prototype Planning

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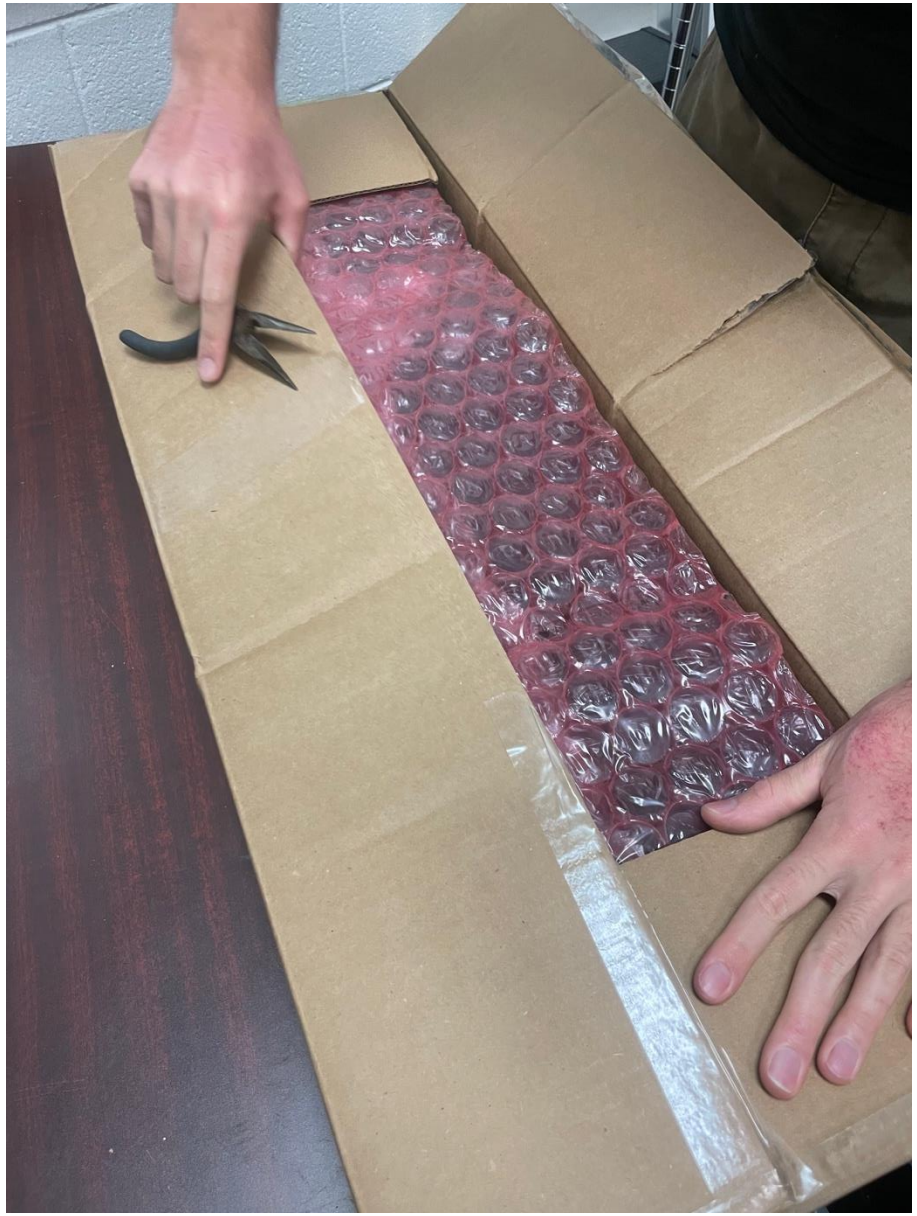
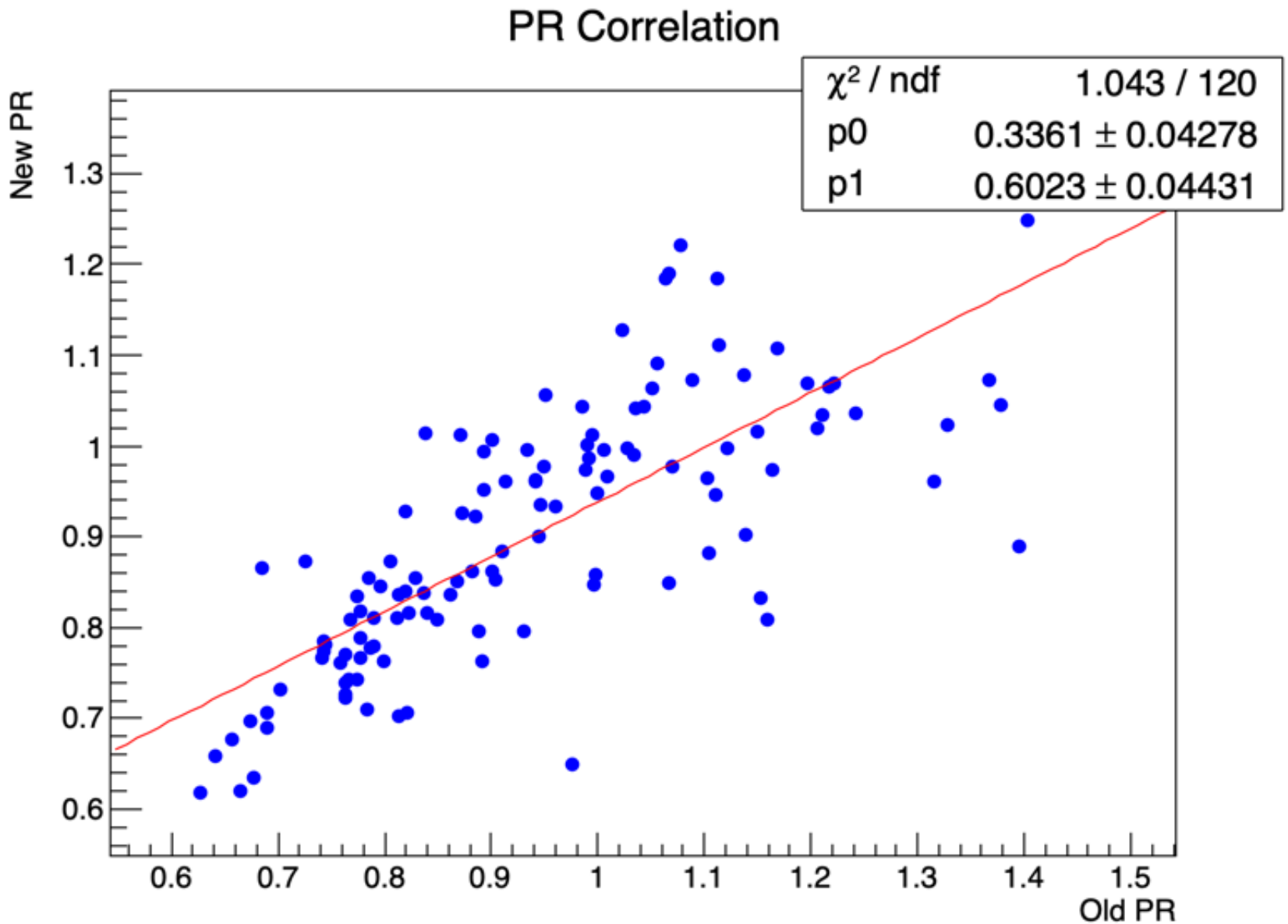
ePIC testing

Spare tiles:

B21	12
B22	15
B23	23
B24	8
B25	12
B26	13
B27	21
B28	11
B29	7
B30	8
B31	8
B32	5




PR Correlation
χ² / ndf 1.043 / 120
p0 0.3361 ± 0.04278
p1 0.6023 ± 0.04431
New PR
Old PR
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4
1.5

Elog Story

- Tiles before March 19 were tested on (335/255) after which (300/25)
- The threshold is the minimum pulse height at which your electronics will register a signal.
- bias voltage sets how strongly it amplifies incoming light signals.
- percent difference=(new−old)/old ×100%

High Percent Difference Causes

Tile ID	% Difference	Cause
B21.835.2101	16.26	Only one test for Old PR; 3 tests for New PR consistent within 5%
B21.892.2271	14.55	Only one test for Old PR; 3 tests for New PR consistent within 5%
B21.904.2306	15.35	Only one test for Old PR; 3 tests for New PR consistent within 5%
B21.101.245	21.23	Old PR tested with Threshold 325 and Bias 255
B21.104.254	24.19	Old PR tested with Threshold 325 and Bias 255
B22.110.270	12.54	Old PR tested with Threshold 325 and Bias 255
B22.1099.2885	13.22	Only one test for Old PR; 3 tests for New PR consistent within 5%
B22.109.269	21.50	Old PR tested with Threshold 325 and Bias 255
B23.128.325	30.30	Old PR tested with Threshold 325 and Bias 255
B23.1177.3121	11.13	Only one test for Old PR; 3 tests for New PR consistent within 5%
B23.364.995	26.94	Old PR Elog entry "the PR was very large and exceed the limiting value of 20%"
B23.1166.3087	16.10	Possibly Different Calibration

Table 1: Tiles with $> 10\%$ difference between Old PR and New PR.

High Percent Difference Causes

Tile ID	% Difference	Cause
B24.2390.6752	11.02	Only one test for Old PR; 3 tests for New PR consistent within 5%
B24.2389.6751	12.43	Only one test for Old PR; 3 tests for New PR consistent within 5%
B25.2185.6139	11.40	Unknown
B25.3127.8964	10.64	Unknown
B25.617.1744	13.26	Unknown
B26.2555.7249	11.44	Unknown
B26.2475.7008	11.88	Unknown
B26.2558.7256	14.50	Unknown
B26.581.1640	20.74	Unknown
B26.1515.4127	20.38	Was used as a fiber reference accoridng to elog entries
B26.1575.4308	14.00	Failed Fiber test

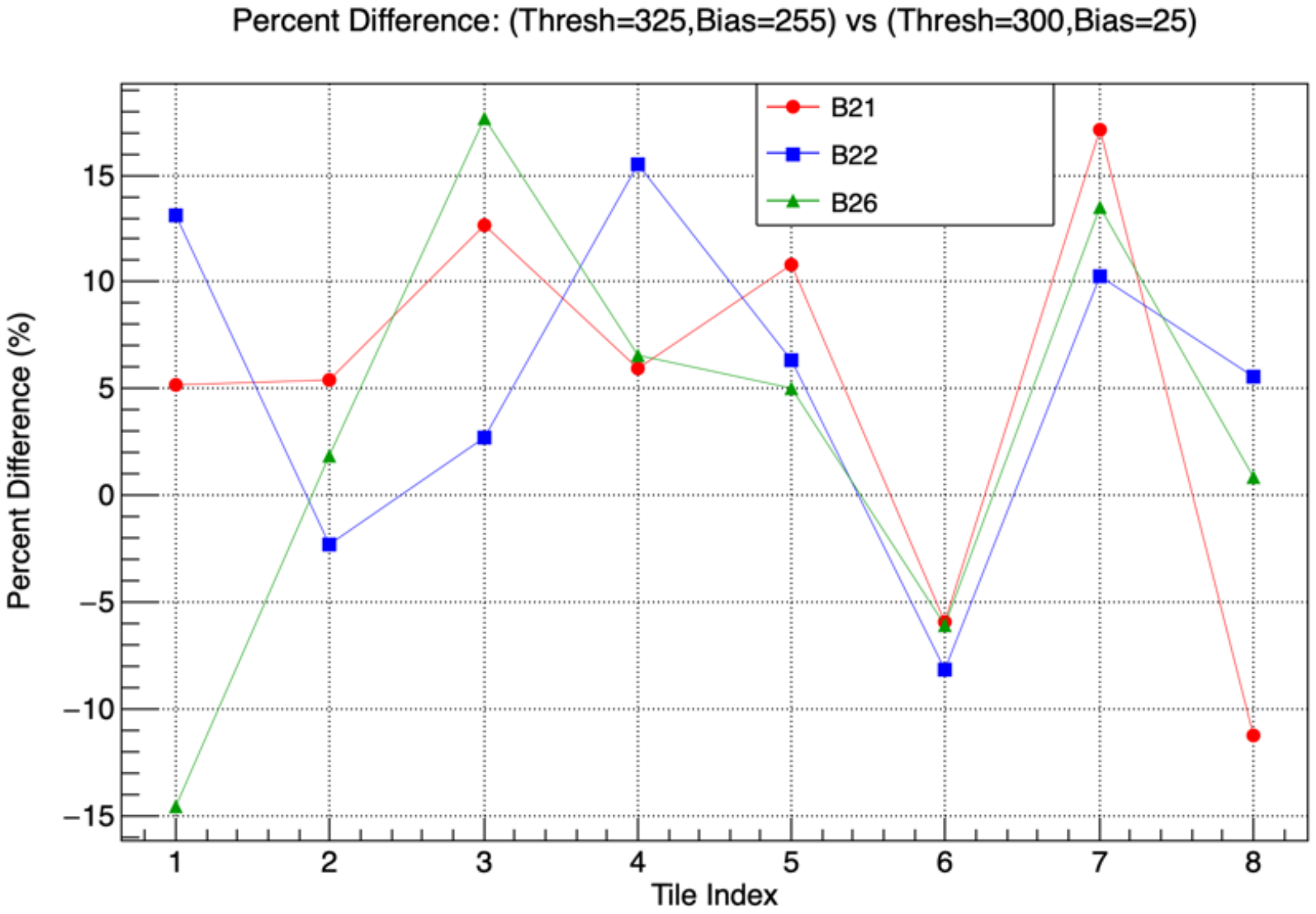
Table 2: Tiles with $> 10\%$ difference between Old PR and New PR.

High Percent Difference Causes

Tile ID	% Difference	Cause
B26.2530.7173	11.24	Unknown
B27.3105.8899	11.67	Only one test for Old PR; 3 tests for New PR consistent within 5%
B27.1611.4416	33.45	Designated as a problematic tile according to wiki entry:
B27.1641.4506	10.36	Only one test for Old PR; 3 tests for New PR consistent within 5%
B28.263.695	20.60	Designated as PR <0.8
B30.1895.5267	12.55	Only one test for Old PR; 2 tests for New PR consistent within 5%
B30.1866.5180	14.71	Only one test for Old PR; 2 tests for New PR consistent within 5%
B30.490.1370	36.29	Unknown
B30.1874.5205	20.90	Unknown
B30.1894.5265	16.26	Unknown

Table 3: Tiles with $> 10\%$ difference between Old PR and New PR.

Effects of Threshold and Bias offset on PR



Tile ID	Old PR (Threshold/Bias)	New PR (Threshold/Bias)
B21.835.2101	0.9958 (300/25)	0.833937 (300/25); 0.876871 (325/255)
B21.892.2271	1.21026 (300/25)	1.03431 (300/25); 1.10919 (325/255)
B21.904.2306	1.24258 (300/25)	1.05188 (300/25); 1.18165 (325/255)
B21.101.245	1.3274 (325/255)	1.04557 (300/25); 1.108 (325/255)
B21.104.254	1.3773 (325/255)	1.04429 (300/25); 1.11269 (325/255)
B22.110.270	1.2221 (325/255)	1.06881 (300/25); 1.16685 (325/255)
B22.1099.2885	0.8202 (300/25)	0.928587 (325/255); 0.849035 (325/255)
B22.109.269	1.3672 (325/255)	1.07333 (300/25)
B23.128.325	1.1592 (325/255)	0.807993 (300/25)
B23.1177.3121	1.1216 (300/25)	0.996711 (300/25)
B23.364.995	1.3151 (300/25)	0.960791 (300/25)
B23.1166.3087	0.8717 (300/25)	1.01204 (300/25)

Table 1: Tiles #1–12 (with $> 10\%$ difference).

Tile ID	Old PR (Threshold/Bias)	New PR (Threshold/Bias)
B24.2390.6752	1.4037 (300/25)	1.24892 (300/25)
B24.2389.6751	1.4504 (300/25)	1.26998 (300/25)
B25.2185.6139	1.0628 (300/25)	1.18391 (300/25)
B25.3127.8964	1.1967 (300/25)	1.06929 (300/25)
B25.617.1744	1.078 (300/25)	1.22102 (300/25)
B26.2555.7249	1.0673 (300/25)	1.18951 (300/25)
B26.2475.7008	0.9003 (300/25)	1.00728 (300/25); 0.981052 (325/255)
B26.2558.7256	0.8922 (300/25)	0.762788 (300/25); 0.901779 (325/255)
B26.581.1640	1.1382 (300/25)	0.902164 (300/25); 1.31635 (325/255)
B26.1515.4127	1.0662 (300/25)	0.848876 (300/25); 0.985581 (325/255)
B26.1575.4308	0.821603 (300/25)	0.70639 (300/25); 0.606909 (325/255)

Table 2: Tiles #13–24 (with $> 10\%$ difference).

Tile ID	Old PR (Threshold/Bias)	New PR (Threshold/Bias)
B26.2530.7173	0.893 (300/25)	0.993339 (300/25); 0.921267 (325/255)
B27.3105.8899	1.15034 (300/25)	1.0161 (300/25)
B27.1611.4416	0.975937 (300/25)	0.649461 (300/25)
B27.1641.4506	1.02254 (300/25)	1.12845 (300/25)
B28.263.695	0.6808 (300/25)	0.821255 (300/25)
B30.1895.5267	1.1023 (300/25)	0.963946 (300/25)
B30.1866.5180	1.1101 (300/25)	0.946791 (300/25)
B30.490.1370	1.3956 (300/25)	0.889165 (300/25)
B30.1874.5205	0.8126 (300/25)	0.982606 (300/25)
B30.1894.5265	1.1638 (300/25)	0.974549 (300/25)

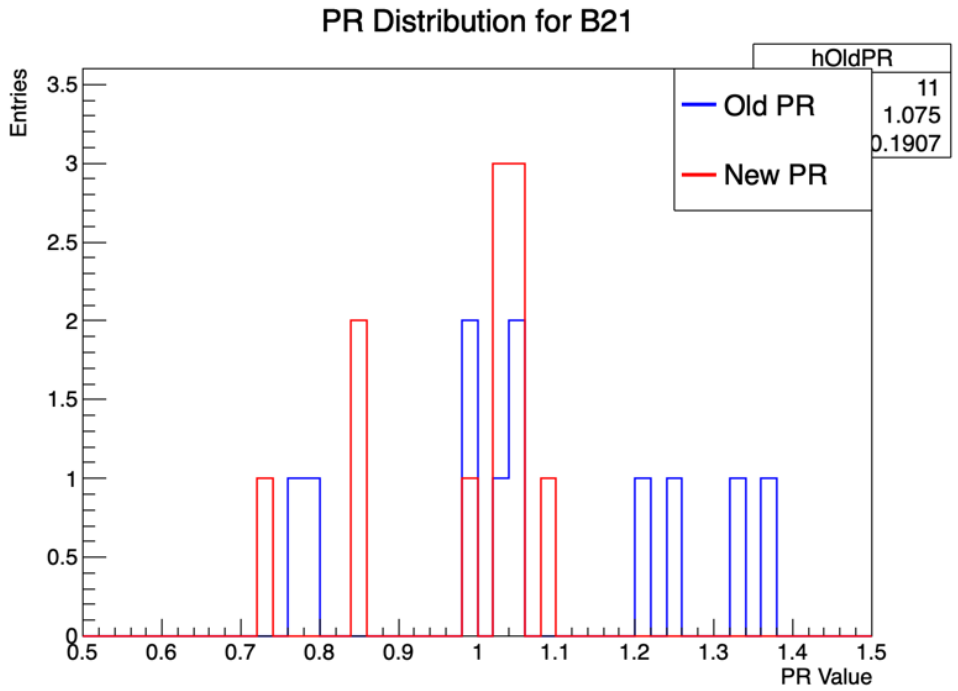
Table 3: Tiles #25–37 (with $> 10\%$ difference). .

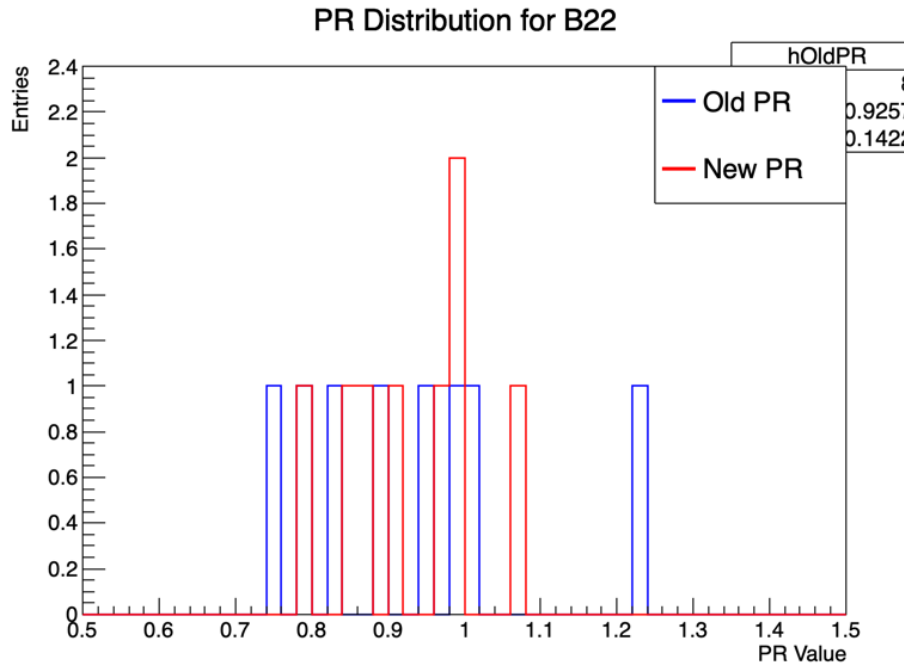
Conclusion

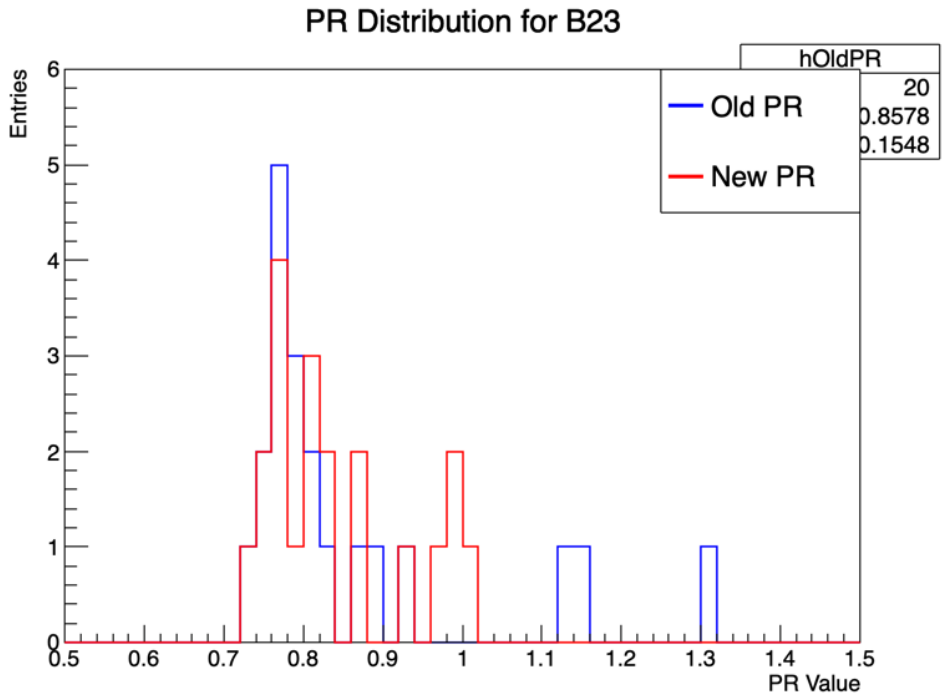
- The current PR values of the spare tiles were compared to their old values, taken prior to being shipped back to GSU
- Causes for the percent difference larger than 10 were investigated, some were found but some were not

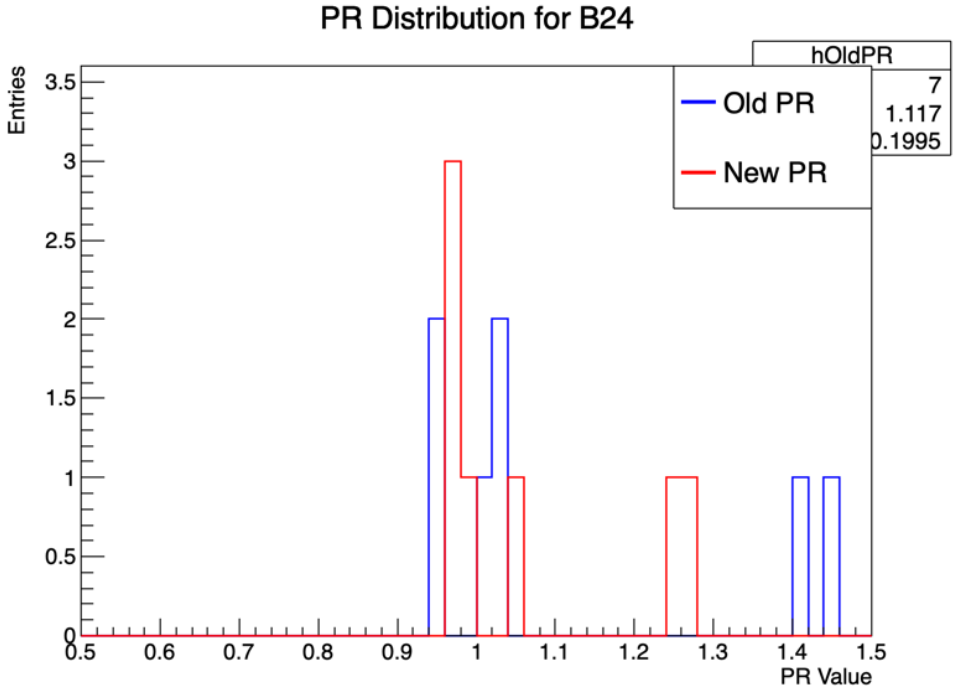
Back up

PR Distributions

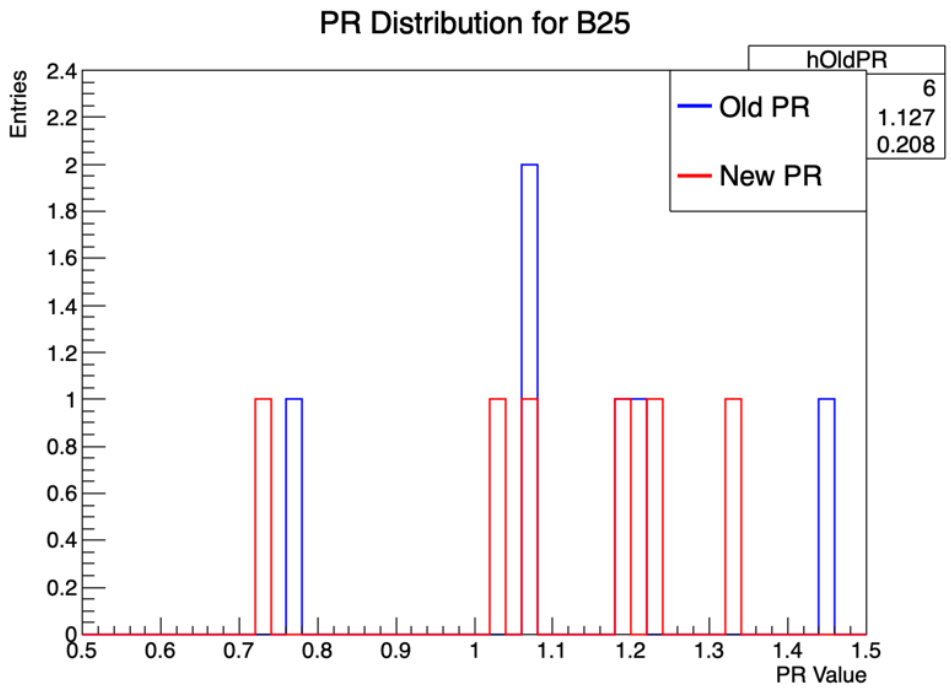


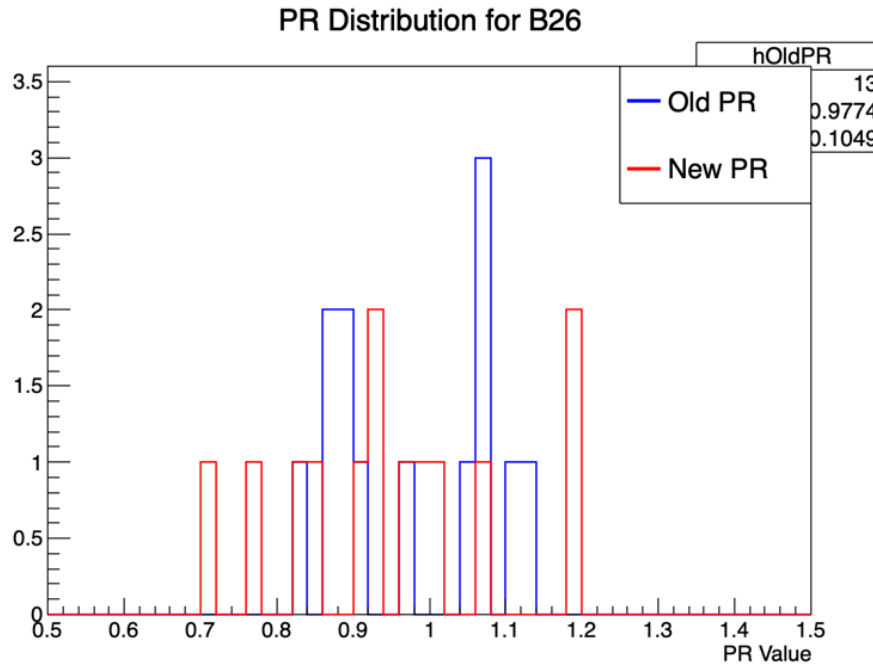


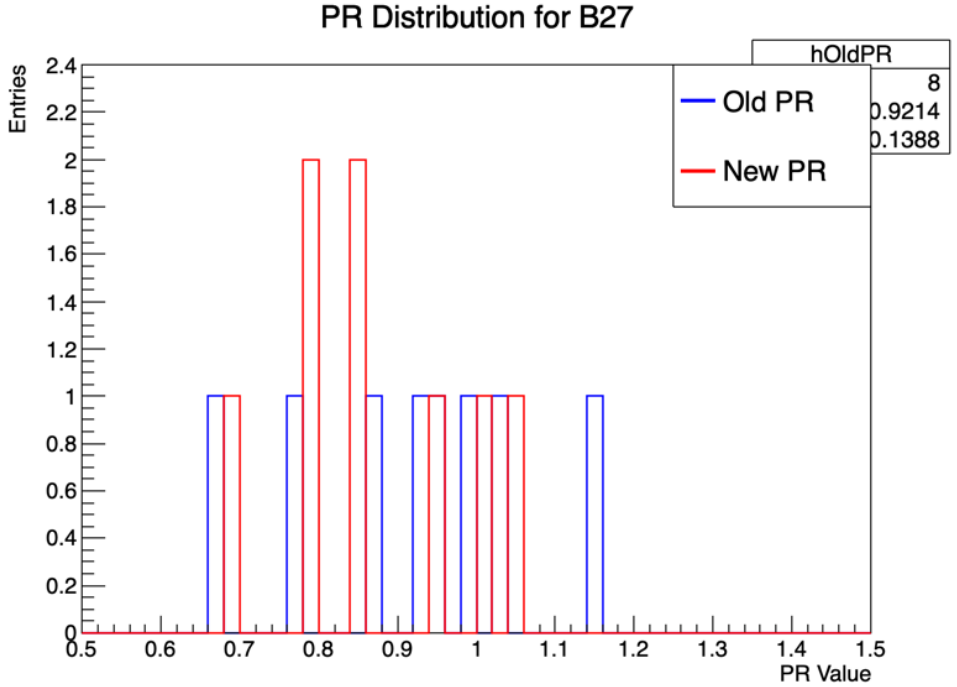


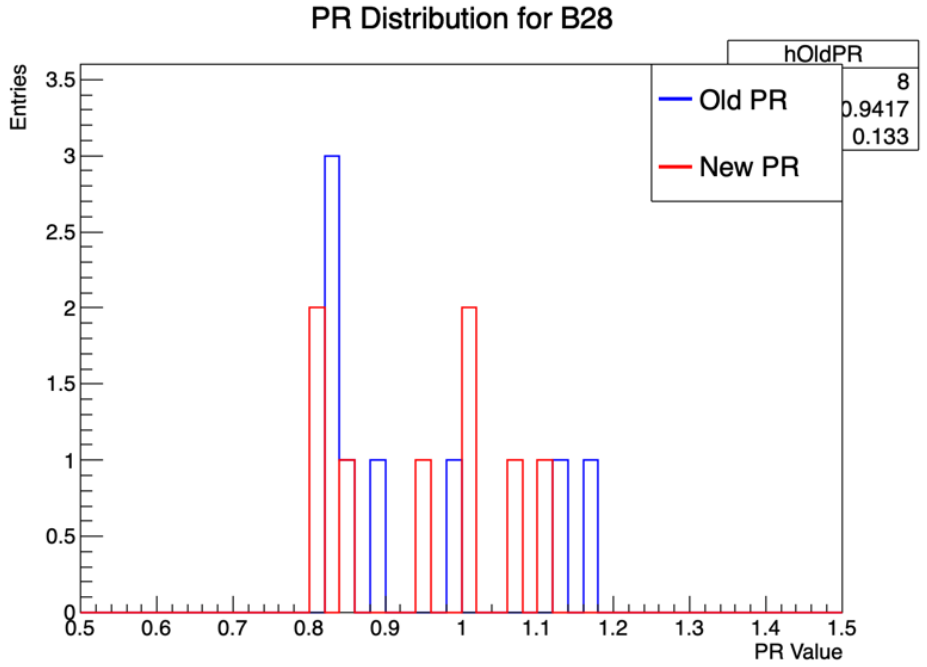


PR Distributions

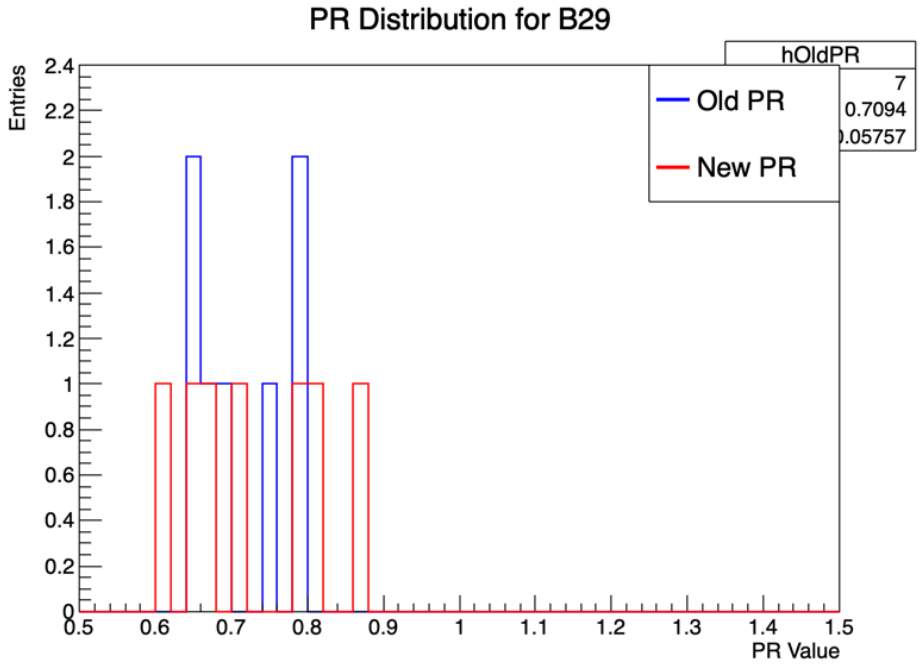


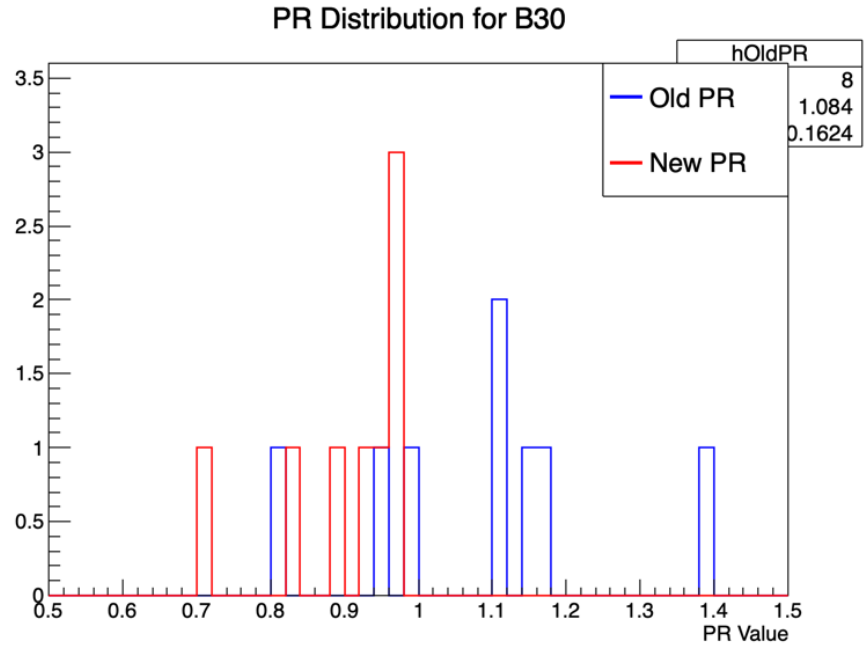


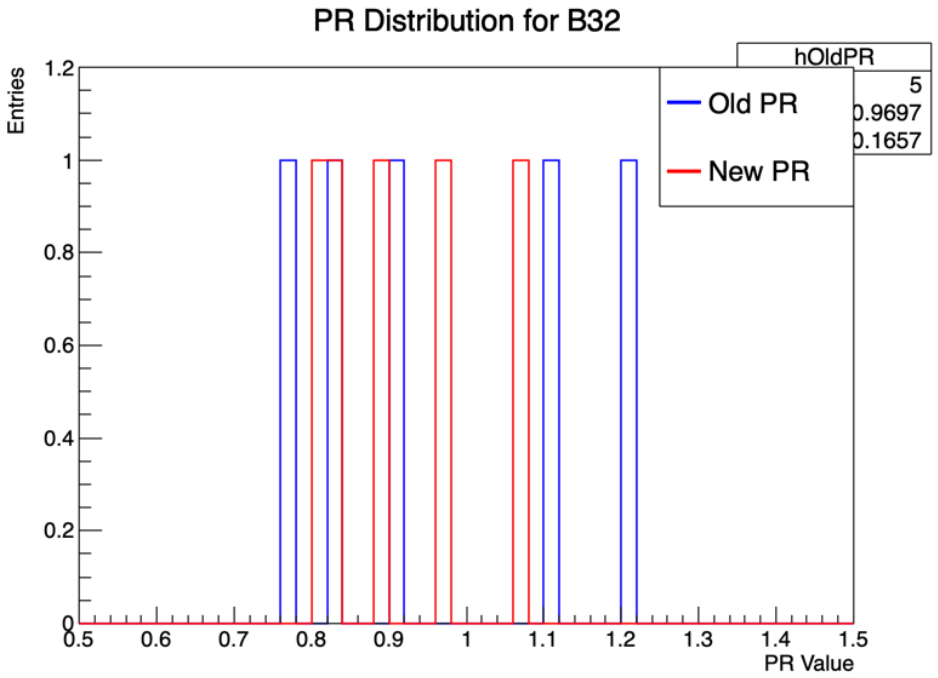


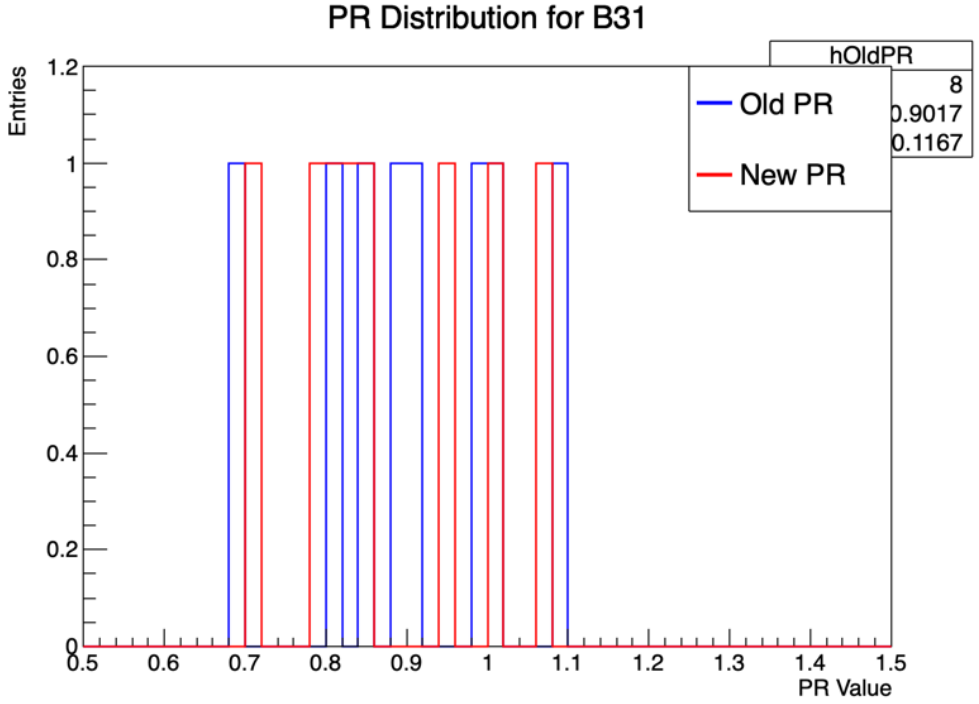


PR Distributions

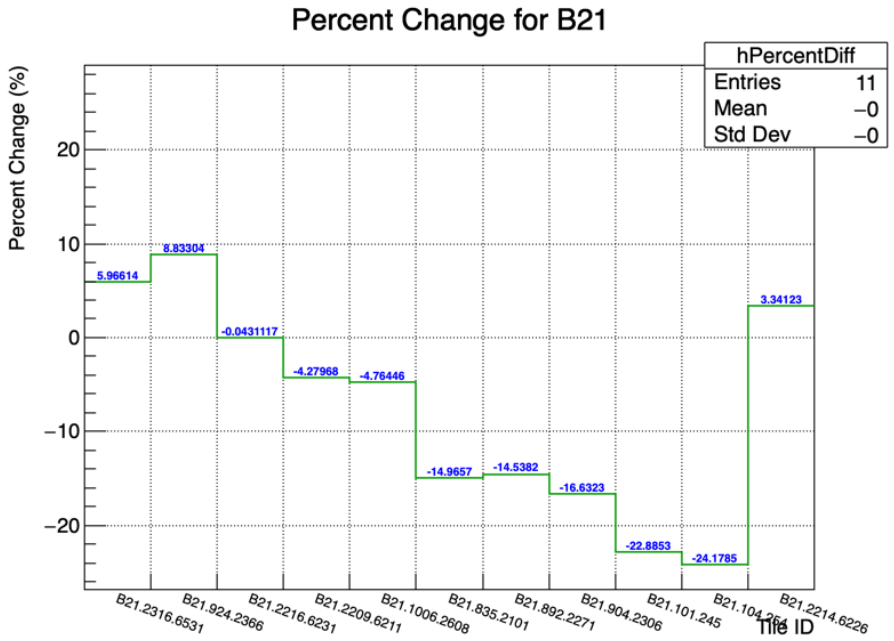


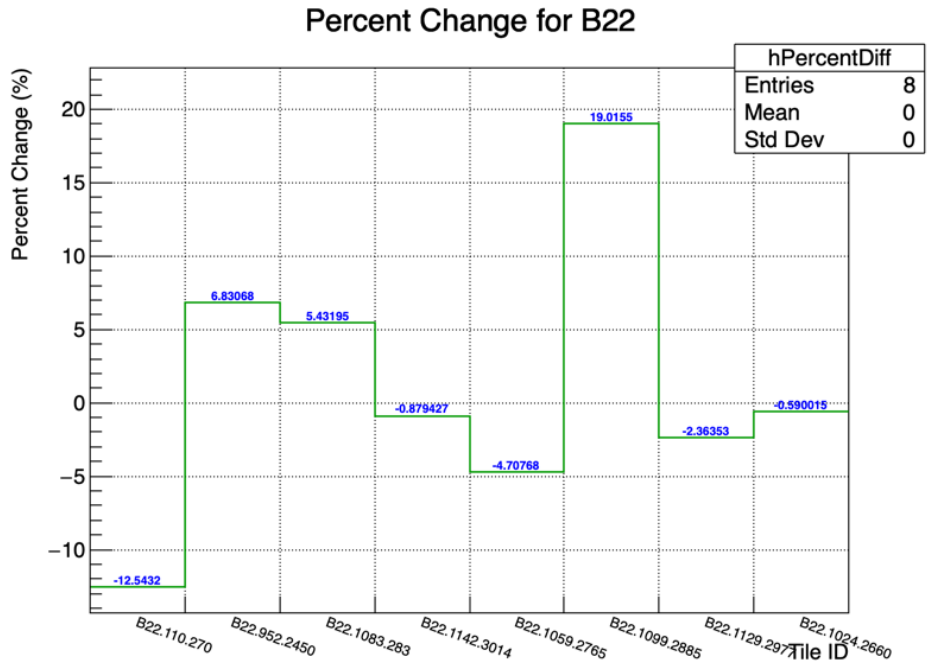


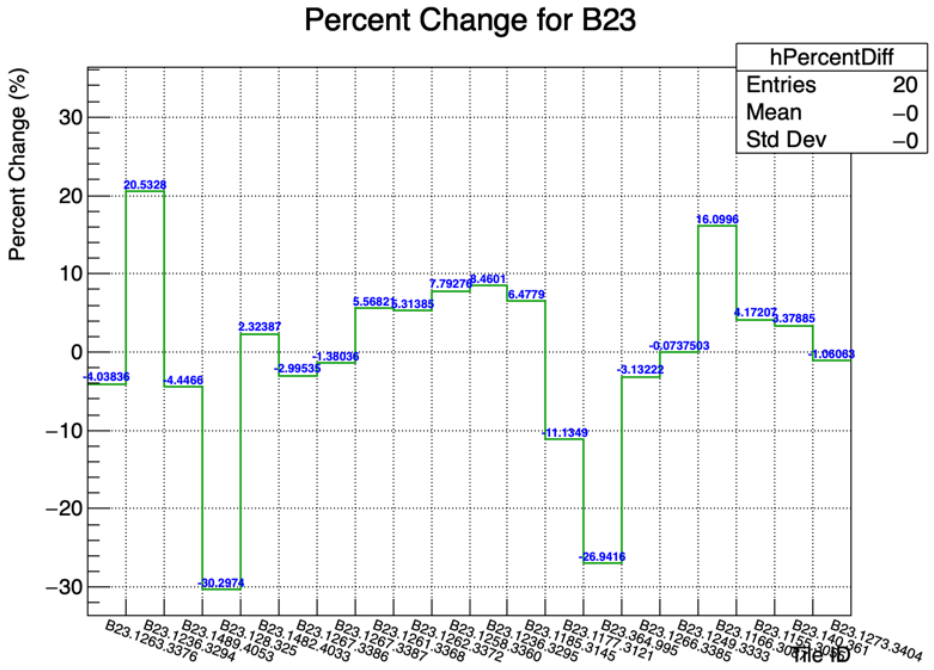


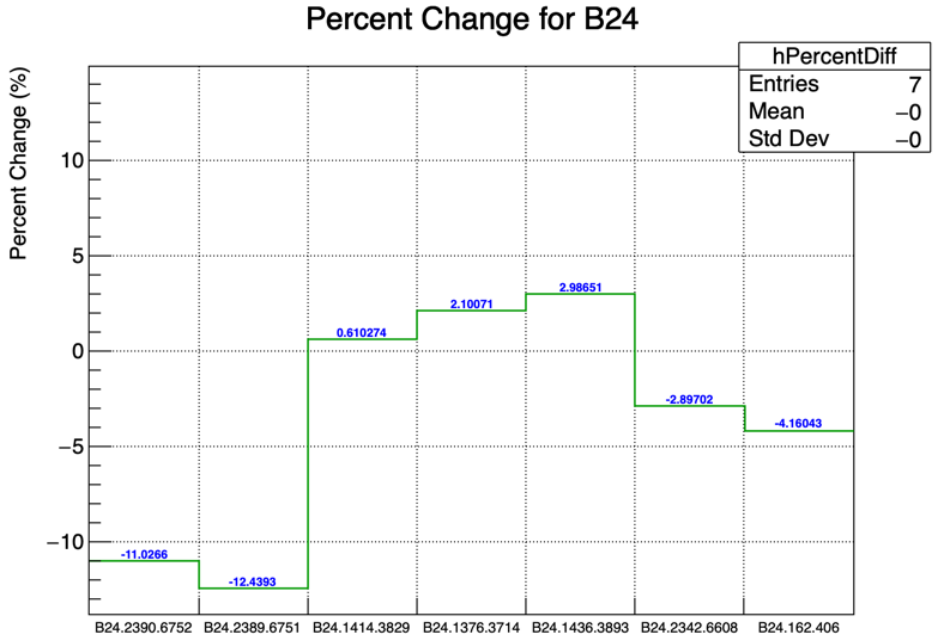


Percent Change

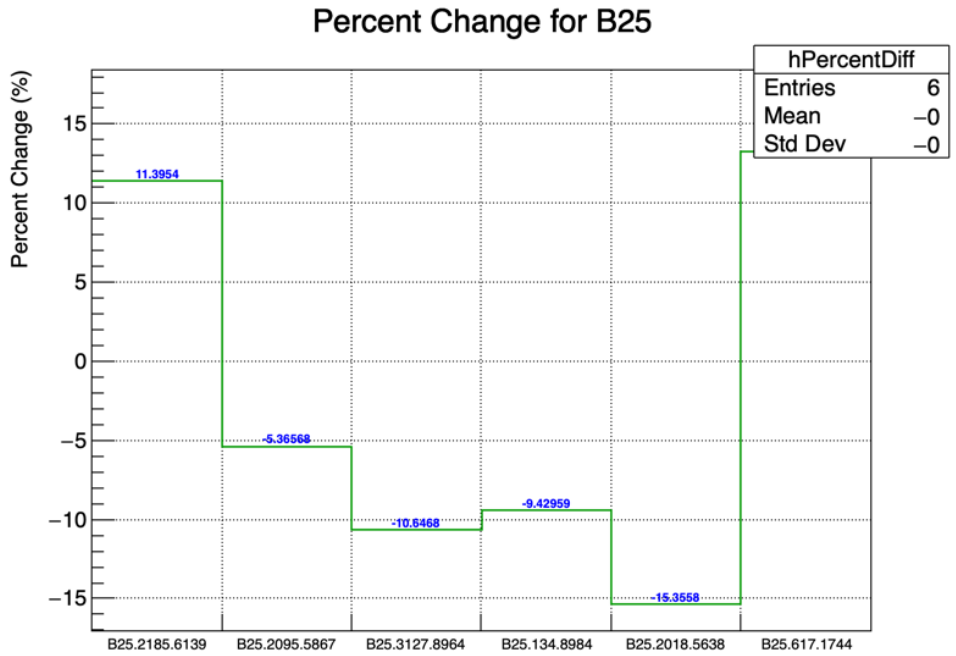


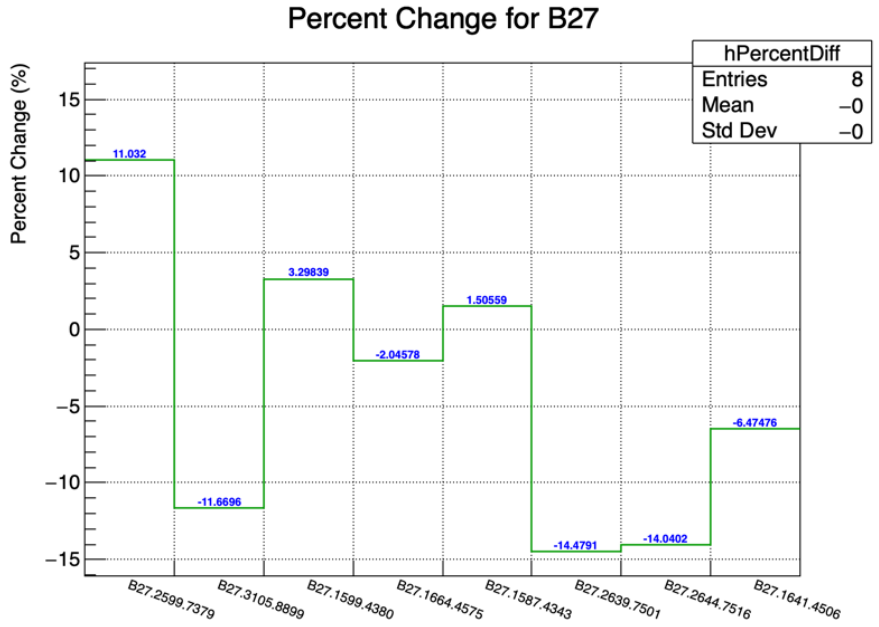


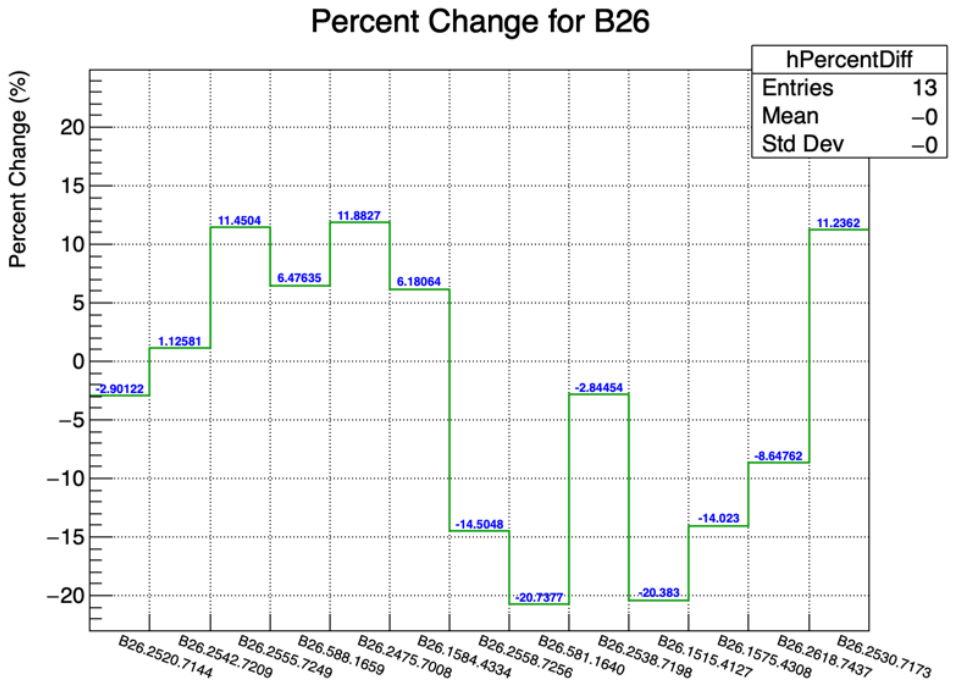


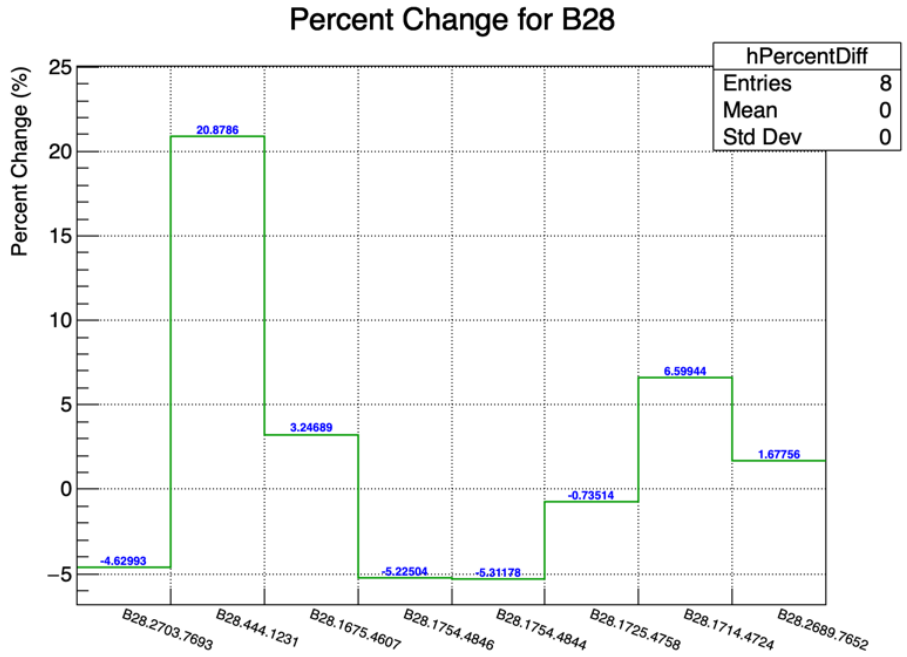


Percent Change









Percent Change