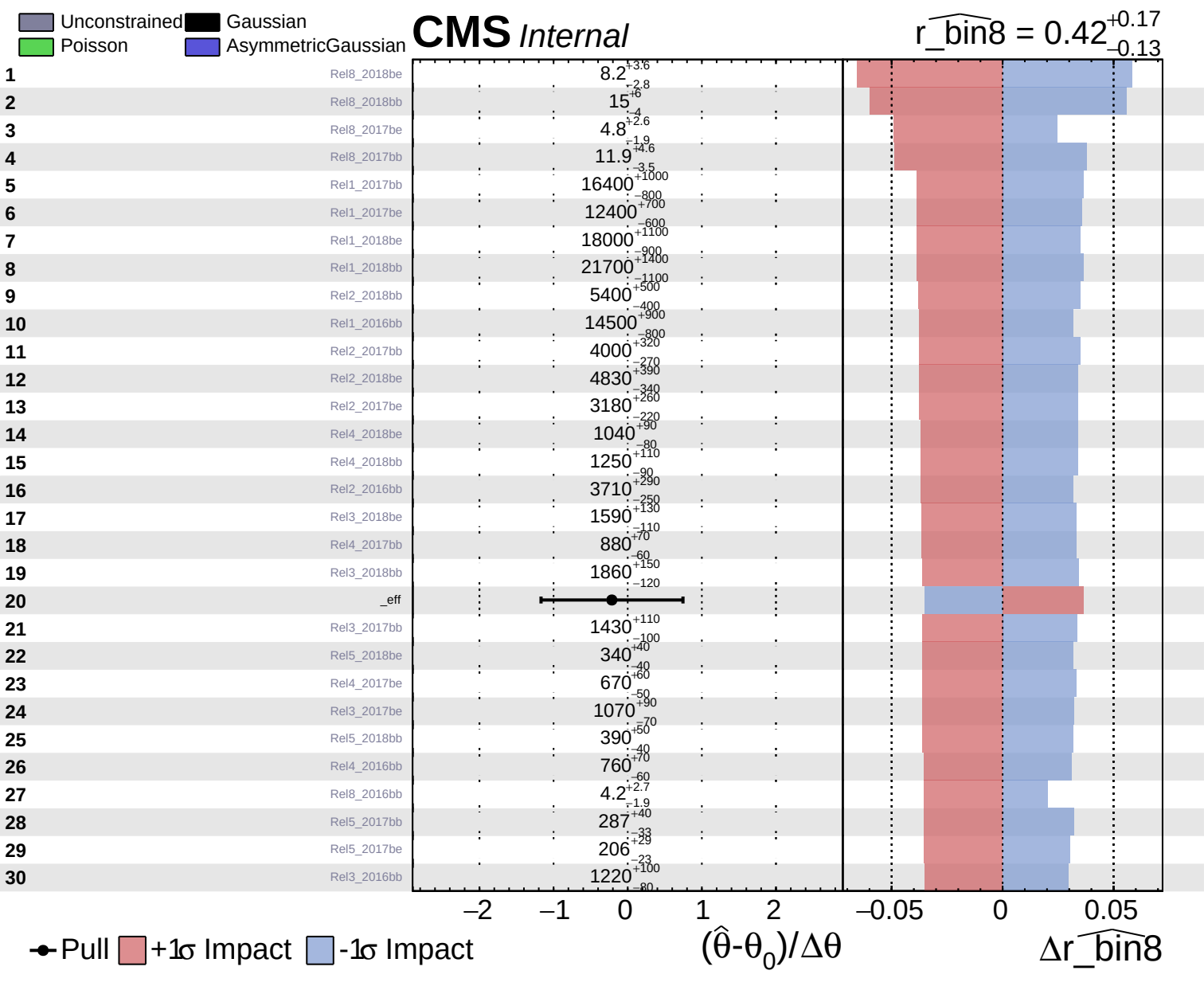
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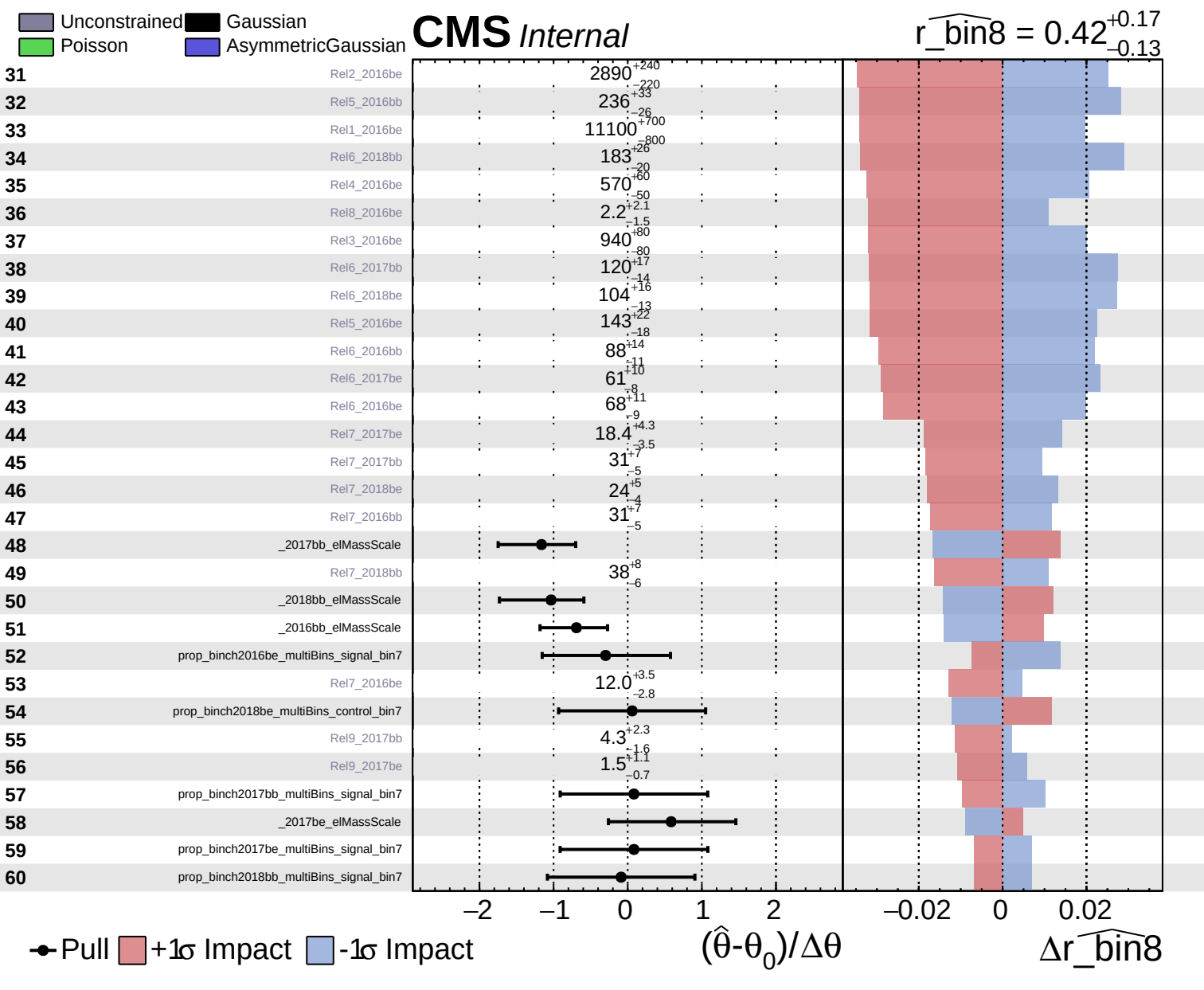
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin8 = 0.42 +0.17 −0.13
1 Rel8_2018be 8.2 +3.6 −2.8
2 Rel8_2018bb 15 +6 −4
3 Rel8_2017be 4.8 +2.6 −1.9
4 Rel8_2017bb 11.9 +4.6 −3.5
5 Rel1_2017bb 16400 +1000 −800
6 Rel1_2017be 12400 +700 −600
7 Rel1_2018be 18000 +1100 −900
8 Rel1_2018bb 21700 +1400 −1100
9 Rel2_2018bb 5400 +500 −400
10 Rel1_2016bb 14500 +900 −800
11 Rel2_2017bb 4000 +320 −270
12 Rel2_2018be 4830 +390 −340
13 Rel2_2017be 3180 +260 −220
14 Rel4_2018be 1040 +90 −80
15 Rel4_2018bb 1250 +110 −90
16 Rel2_2016bb 3710 +290 −250
17 Rel3_2018be 1590 +130 −110
18 Rel4_2017bb 880 +70 −60
19 Rel3_2018bb 1860 +150 −120
20 _eff
21 Rel3_2017bb 1430 +110 −100
22 Rel5_2018be 340 +40 −40
23 Rel4_2017be 670 +60 −50
24 Rel3_2017be 1070 +90 −70
25 Rel5_2018bb 390 +50 −40
26 Rel4_2016bb 760 +70 −60
27 Rel8_2016bb 4.2 +2.7 −1.9
28 Rel5_2017bb 287 +40 −33
29 Rel5_2017be 206 +29 −23
30 Rel3_2016bb 1220 +100 −80
−2 −1 0 1 2
−0.05 0 0.05
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin8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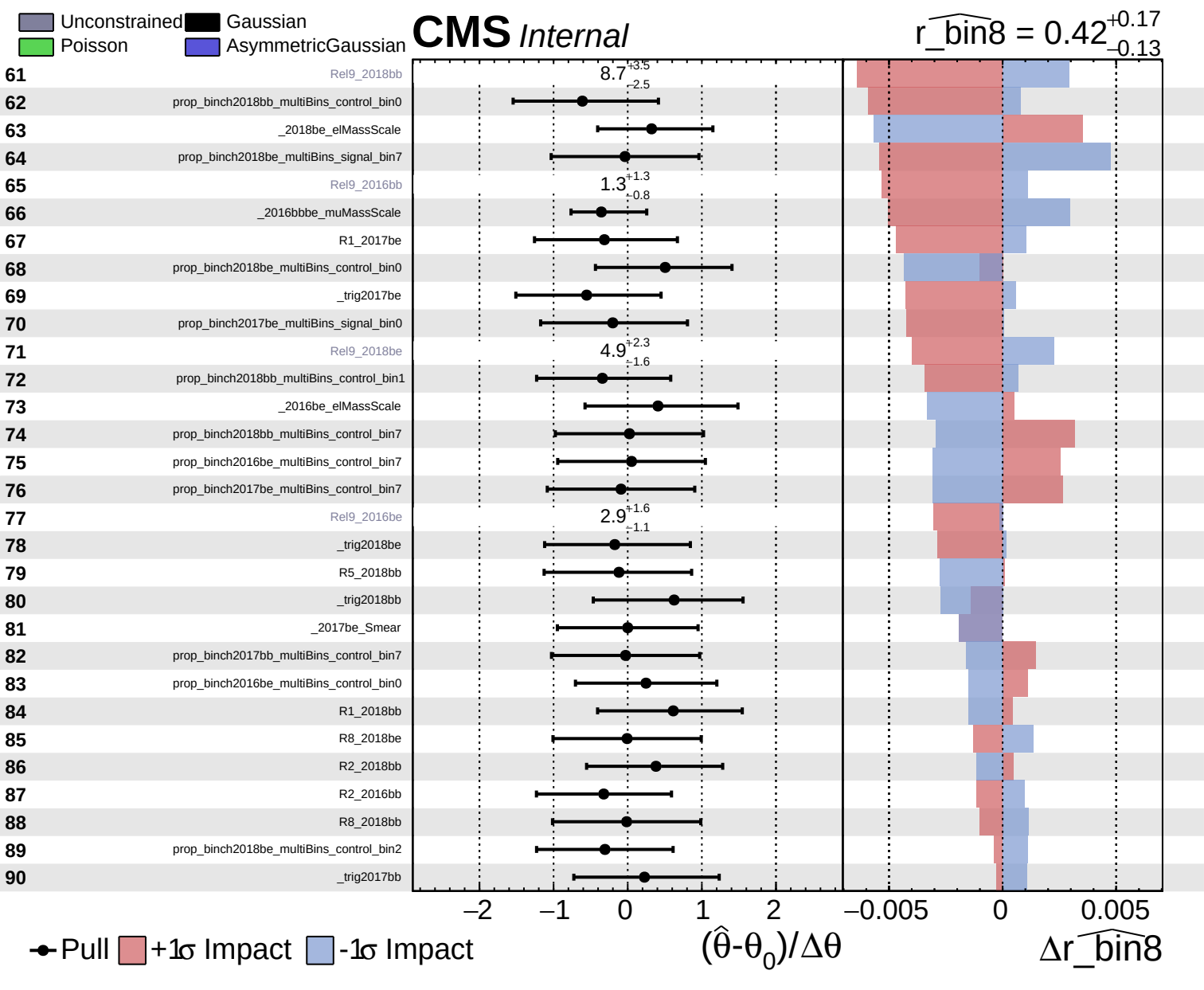
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin8 = 0.42 +0.17 −0.13
31 Rel2_2016be 2890 +240 −220
32 Rel5_2016bb 236 +33 −26
33 Rel1_2016be 11100 +700 −800
34 Rel6_2018bb 183 +26 −20
35 Rel4_2016be 570 +60 −50
36 Rel8_2016be 2.2 +2.1 −1.5
37 Rel3_2016be 940 +80 −80
38 Rel6_2017bb 120 +17 −14
39 Rel6_2018be 104 +16 −13
40 Rel5_2016be 143 +22 −18
41 Rel6_2016bb 88 +14 −11
42 Rel6_2017be 61 +10 −8
43 Rel6_2016be 68 +11 −9
44 Rel7_2017be 18.4 +4.3 −3.5
45 Rel7_2017bb 31 +7 −5
46 Rel7_2018be 24 +5 −4
47 Rel7_2016bb 31 +7 −5
48 _2017bb_elMassScale
49 Rel7_2018bb 38 +8 −6
50 _2018bb_elMassScale
51 _2016bb_elMassScale
52 prop_binch2016be_multiBins_signal_bin7
53 Rel7_2016be 12.0 +3.5 −2.8
54 prop_binch2018be_multiBins_control_bin7
55 Rel9_2017bb 4.3 +2.3 −1.6
56 Rel9_2017be 1.5 +1.1 −0.7
57 prop_binch2017bb_multiBins_signal_bin7
58 _2017be_elMassScale
59 prop_binch2017be_multiBins_signal_bin7
60 prop_binch2018bb_multiBins_signal_bin7
−2 −1 0 1 2
(θ̂-θ0)/Δθ
−0.02 0 0.02
Δr_bin8
Pull
+1σ Impact
-1σ Impact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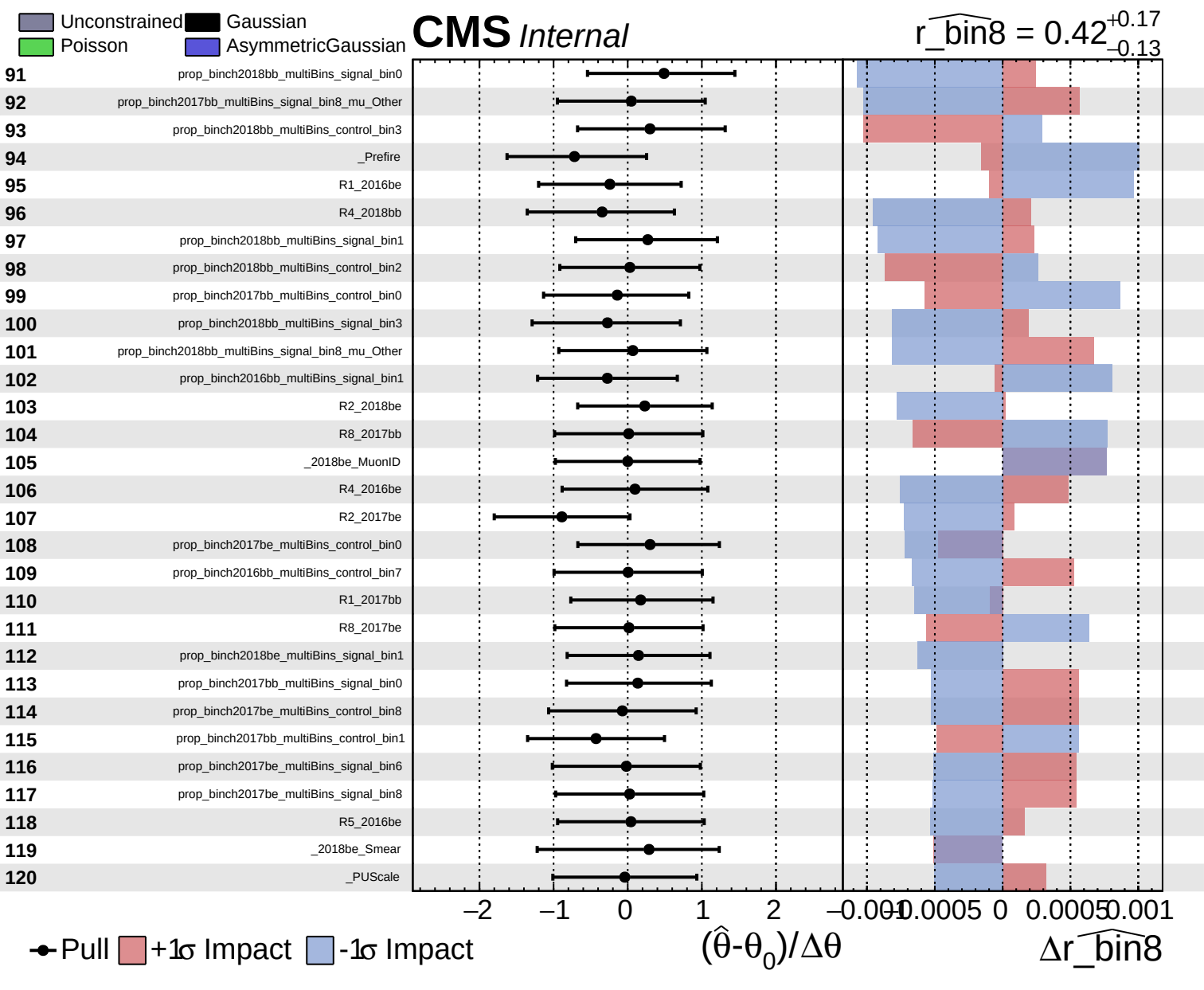
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin8 = 0.42 +0.17 −0.13
61 Rel9_2018bb
62 prop_binch2018bb_multiBins_control_bin0
63 _2018be_elMassScale
64 prop_binch2018be_multiBins_signal_bin7
65 Rel9_2016bb
66 _2016bbbe_muMassScale
67 R1_2017be
68 prop_binch2018be_multiBins_control_bin0
69 _trig2017be
70 prop_binch2017be_multiBins_signal_bin0
71 Rel9_2018be
72 prop_binch2018bb_multiBins_control_bin1
73 _2016be_elMassScale
74 prop_binch2018bb_multiBins_control_bin7
75 prop_binch2016be_multiBins_control_bin7
76 prop_binch2017be_multiBins_control_bin7
77 Rel9_2016be
78 _trig2018be
79 R5_2018bb
80 _trig2018bb
81 _2017be_Smear
82 prop_binch2017bb_multiBins_control_bin7
83 prop_binch2016be_multiBins_control_bin0
84 R1_2018bb
85 R8_2018be
86 R2_2018bb
87 R2_2016bb
88 R8_2018bb
89 prop_binch2018be_multiBins_control_bin2
90 _trig2017bb
8.7 +3.5 −2.5
1.3 +1.3 −0.8
4.9 +2.3 −1.6
2.9 +1.6 −1.1
−2
−1
0
1
2
−0.005
0
0.005
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin8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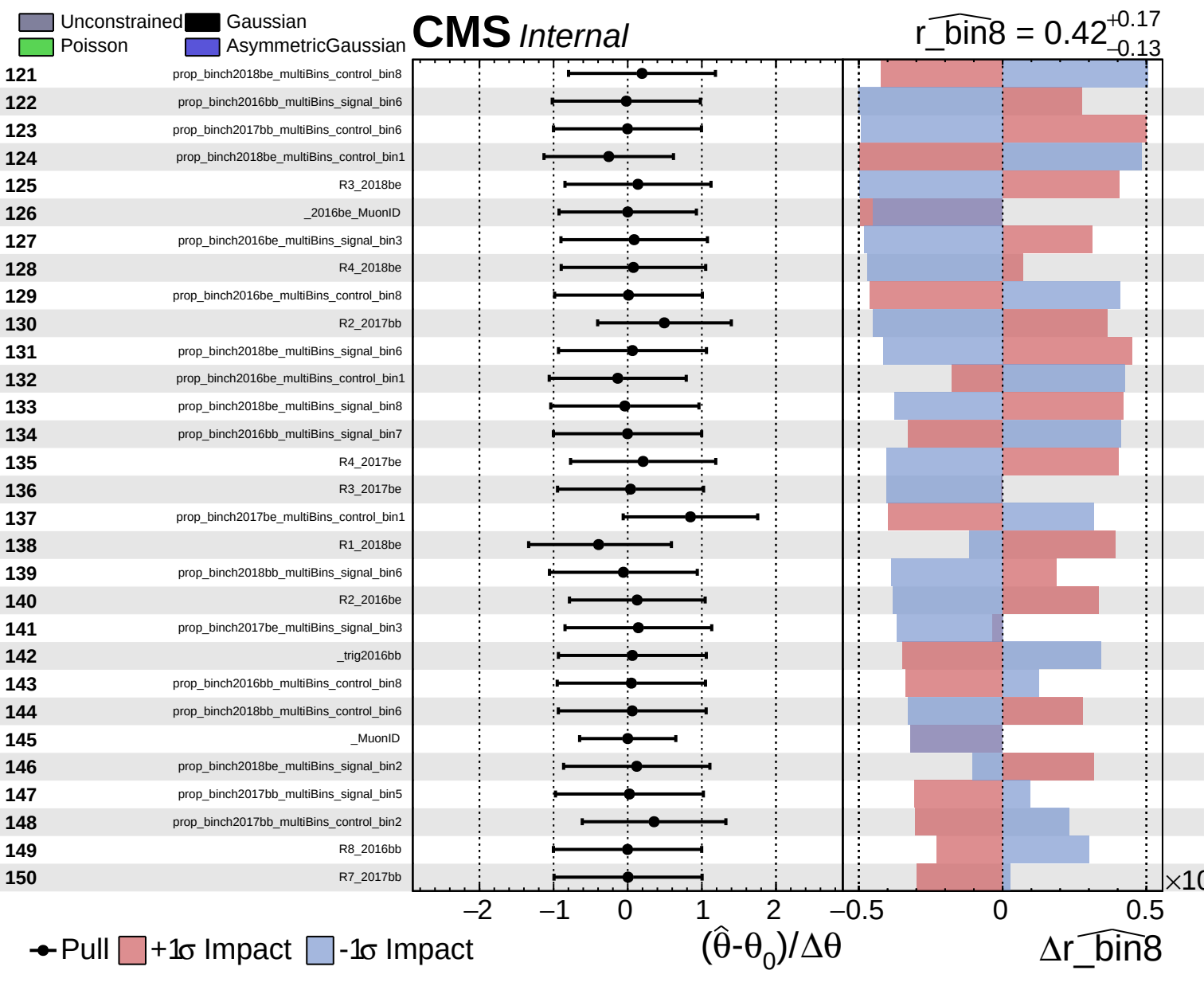
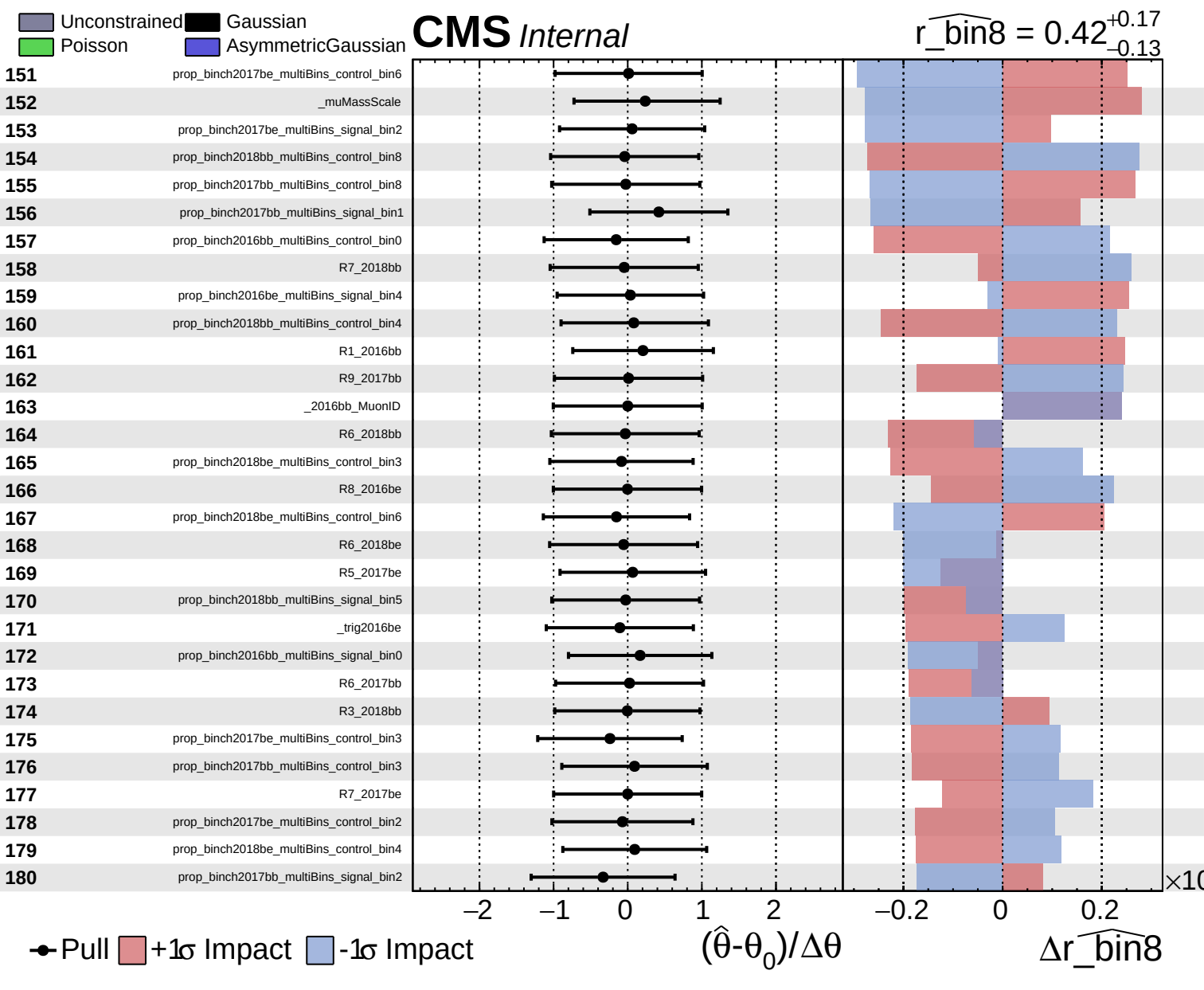
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin8 = 0.42 +0.17 −0.13
91 prop_binch2018bb_multiBins_signal_bin0
92 prop_binch2017bb_multiBins_signal_bin8_mu_Other
93 prop_binch2018bb_multiBins_control_bin3
94 _Prefire
95 R1_2016be
96 R4_2018bb
97 prop_binch2018bb_multiBins_signal_bin1
98 prop_binch2018bb_multiBins_control_bin2
99 prop_binch2017bb_multiBins_control_bin0
100 prop_binch2018bb_multiBins_signal_bin3
101 prop_binch2018bb_multiBins_signal_bin8_mu_Other
102 prop_binch2016bb_multiBins_signal_bin1
103 R2_2018be
104 R8_2017bb
105 _2018be_MuonID
106 R4_2016be
107 R2_2017be
108 prop_binch2017be_multiBins_control_bin0
109 prop_binch2016bb_multiBins_control_bin7
110 R1_2017bb
111 R8_2017be
112 prop_binch2018be_multiBins_signal_bin1
113 prop_binch2017bb_multiBins_signal_bin0
114 prop_binch2017be_multiBins_control_bin8
115 prop_binch2017bb_multiBins_control_bin1
116 prop_binch2017be_multiBins_signal_bin6
117 prop_binch2017be_multiBins_signal_bin8
118 R5_2016be
119 _2018be_Smear
120 _PUScale
−2 −1 0 1 2
−0.001 −0.0005 0 0.0005 0.001
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin8


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin8 = 0.42 +0.17 −0.13
121 prop_binch2018be_multiBins_control_bin8
122 prop_binch2016bb_multiBins_signal_bin6
123 prop_binch2017bb_multiBins_control_bin6
124 prop_binch2018be_multiBins_control_bin1
125 R3_2018be
126 _2016be_MuonID
127 prop_binch2016be_multiBins_signal_bin3
128 R4_2018be
129 prop_binch2016be_multiBins_control_bin8
130 R2_2017bb
131 prop_binch2018be_multiBins_signal_bin6
132 prop_binch2016be_multiBins_control_bin1
133 prop_binch2018be_multiBins_signal_bin8
134 prop_binch2016bb_multiBins_signal_bin7
135 R4_2017be
136 R3_2017be
137 prop_binch2017be_multiBins_control_bin1
138 R1_2018be
139 prop_binch2018bb_multiBins_signal_bin6
140 R2_2016be
141 prop_binch2017be_multiBins_signal_bin3
142 _trig2016bb
143 prop_binch2016bb_multiBins_control_bin8
144 prop_binch2018bb_multiBins_control_bin6
145 _MuonID
146 prop_binch2018be_multiBins_signal_bin2
147 prop_binch2017bb_multiBins_signal_bin5
148 prop_binch2017bb_multiBins_control_bin2
149 R8_2016bb
150 R7_2017bb
×10
−2 −1 0 1 2
−0.5 0 0.5
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin8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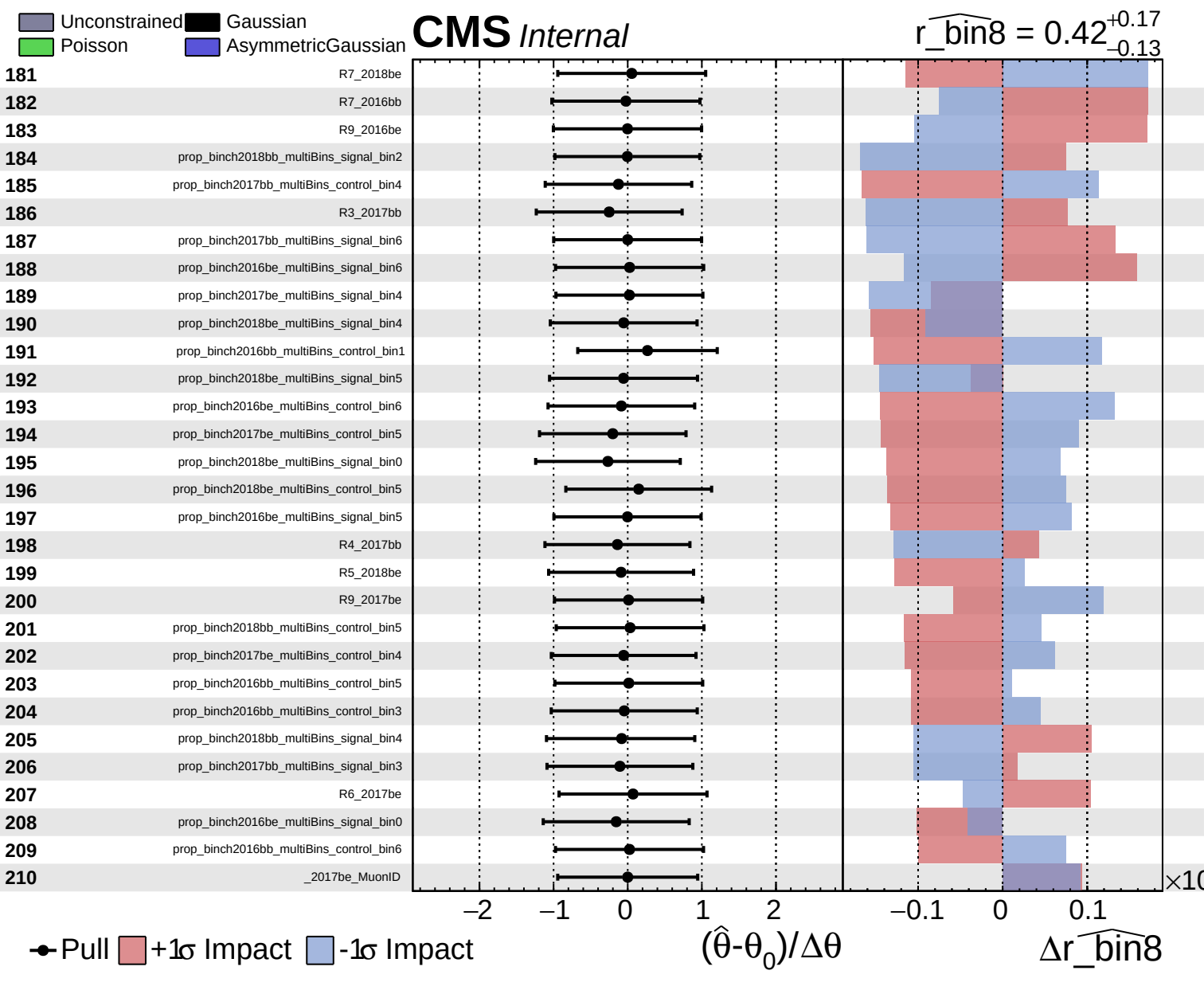
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin8 = 0.42 +0.17 −0.13
151 prop_binch2017be_multiBins_control_bin6
152 _muMassScale
153 prop_binch2017be_multiBins_signal_bin2
154 prop_binch2018bb_multiBins_control_bin8
155 prop_binch2017bb_multiBins_control_bin8
156 prop_binch2017bb_multiBins_signal_bin1
157 prop_binch2016bb_multiBins_control_bin0
158 R7_2018bb
159 prop_binch2016be_multiBins_signal_bin4
160 prop_binch2018bb_multiBins_control_bin4
161 R1_2016bb
162 R9_2017bb
163 _2016bb_MuonID
164 R6_2018bb
165 prop_binch2018be_multiBins_control_bin3
166 R8_2016be
167 prop_binch2018be_multiBins_control_bin6
168 R6_2018be
169 R5_2017be
170 prop_binch2018bb_multiBins_signal_bin5
171 _trig2016be
172 prop_binch2016bb_multiBins_signal_bin0
173 R6_2017bb
174 R3_2018bb
175 prop_binch2017be_multiBins_control_bin3
176 prop_binch2017bb_multiBins_control_bin3
177 R7_2017be
178 prop_binch2017be_multiBins_control_bin2
179 prop_binch2018be_multiBins_control_bin4
180 prop_binch2017bb_multiBins_signal_bin2
−2 −1 0 1 2
−0.2 0 0.2
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin8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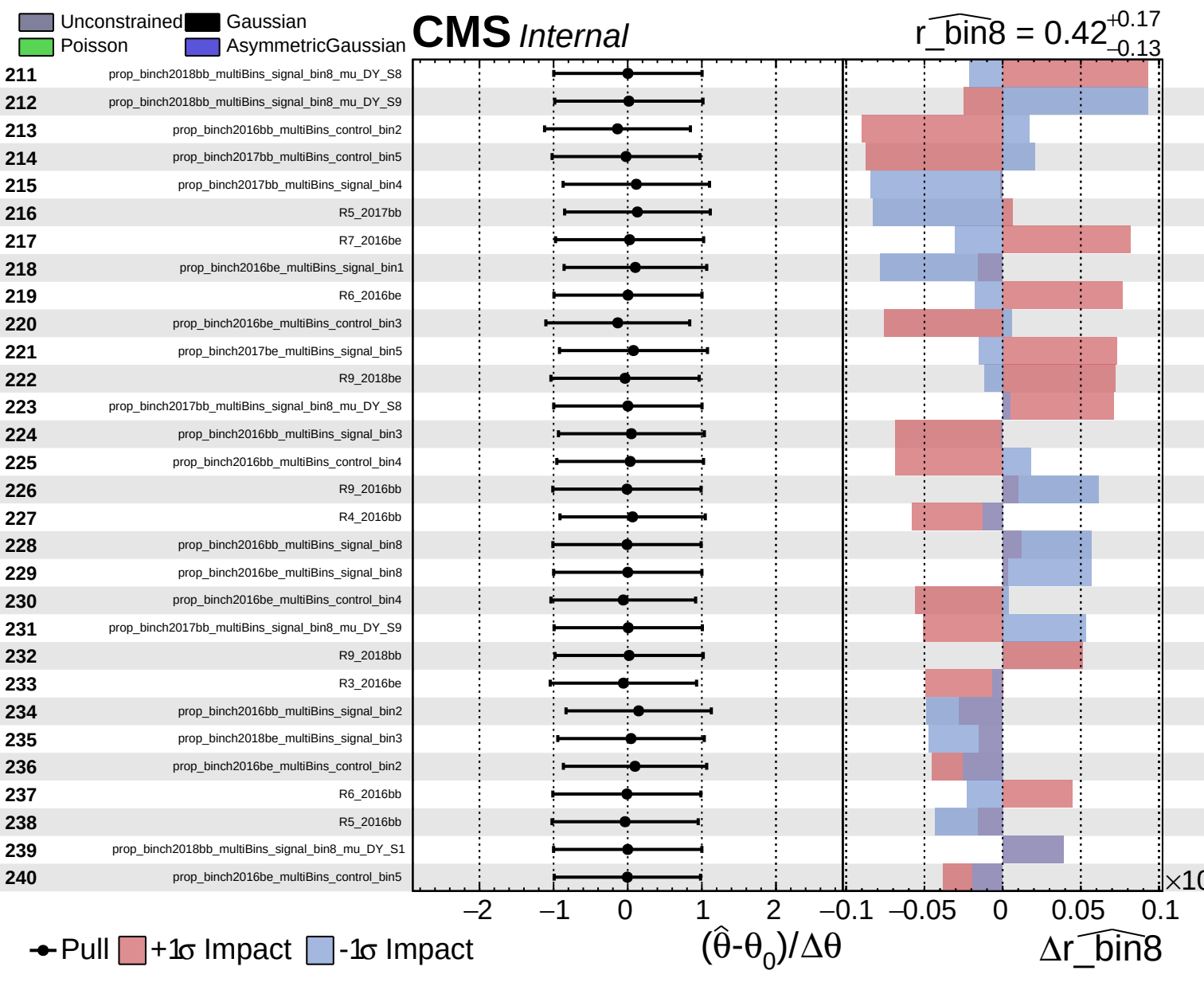
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin8 = 0.42 +0.17 −0.13
181 R7_2018be
182 R7_2016bb
183 R9_2016be
184 prop_binch2018bb_multiBins_signal_bin2
185 prop_binch2017bb_multiBins_control_bin4
186 R3_2017bb
187 prop_binch2017bb_multiBins_signal_bin6
188 prop_binch2016be_multiBins_signal_bin6
189 prop_binch2017be_multiBins_signal_bin4
190 prop_binch2018be_multiBins_signal_bin4
191 prop_binch2016bb_multiBins_control_bin1
192 prop_binch2018be_multiBins_signal_bin5
193 prop_binch2016be_multiBins_control_bin6
194 prop_binch2017be_multiBins_control_bin5
195 prop_binch2018be_multiBins_signal_bin0
196 prop_binch2018be_multiBins_control_bin5
197 prop_binch2016be_multiBins_signal_bin5
198 R4_2017bb
199 R5_2018be
200 R9_2017be
201 prop_binch2018bb_multiBins_control_bin5
202 prop_binch2017be_multiBins_control_bin4
203 prop_binch2016bb_multiBins_control_bin5
204 prop_binch2016bb_multiBins_control_bin3
205 prop_binch2018bb_multiBins_signal_bin4
206 prop_binch2017bb_multiBins_signal_bin3
207 R6_2017be
208 prop_binch2016be_multiBins_signal_bin0
209 prop_binch2016bb_multiBins_control_bin6
210 _2017be_MuonID
−2 −1 0 1 2
−0.1 0 0.1
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin8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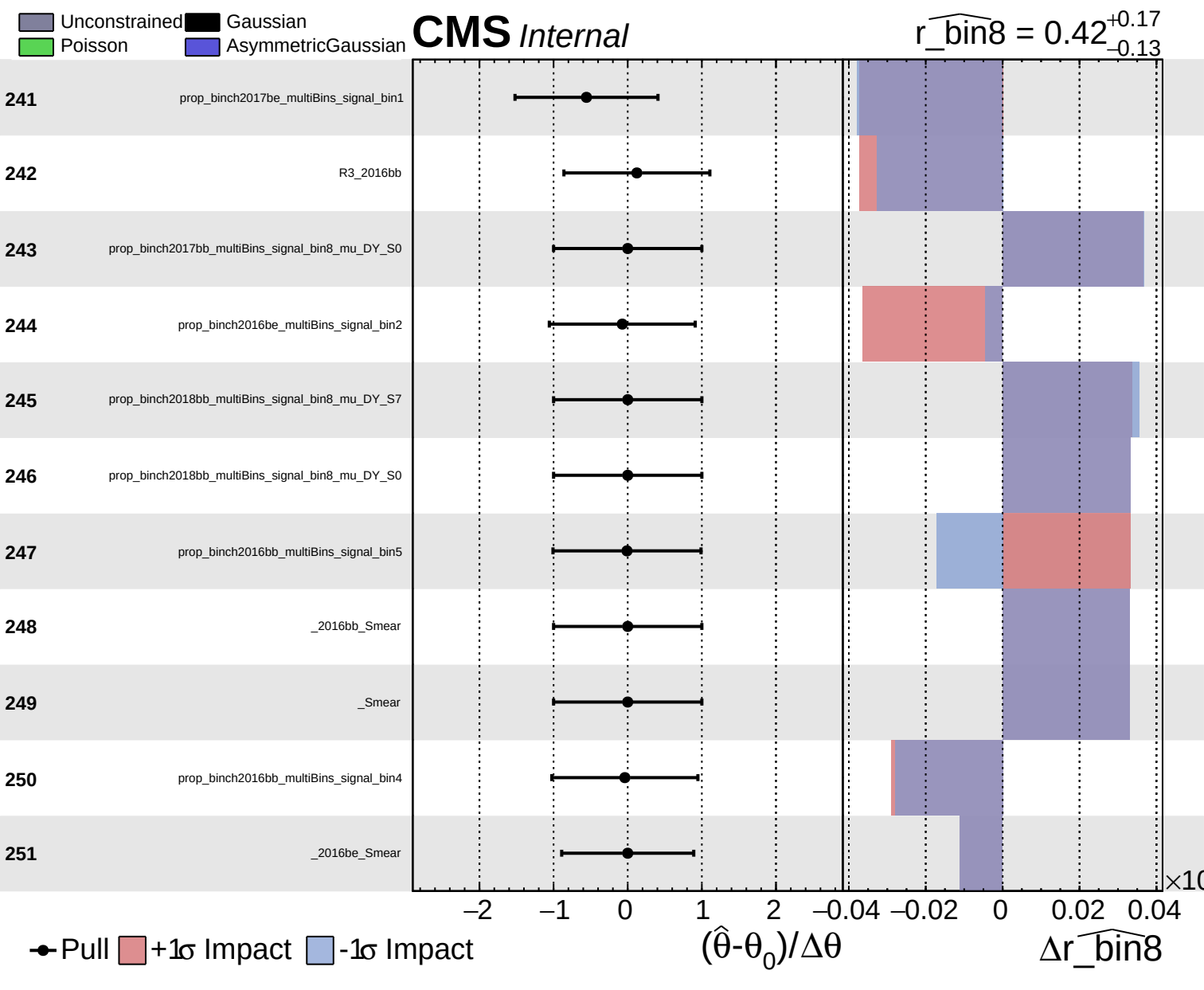
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin8 = 0.42 +0.17 −0.13
211 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S8
212 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S9
213 prop_binch2016bb_multiBins_control_bin2
214 prop_binch2017bb_multiBins_control_bin5
215 prop_binch2017bb_multiBins_signal_bin4
216 R5_2017bb
217 R7_2016be
218 prop_binch2016be_multiBins_signal_bin1
219 R6_2016be
220 prop_binch2016be_multiBins_control_bin3
221 prop_binch2017be_multiBins_signal_bin5
222 R9_2018be
223 prop_binch2017bb_multiBins_signal_bin8_mu_DY_S8
224 prop_binch2016bb_multiBins_signal_bin3
225 prop_binch2016bb_multiBins_control_bin4
226 R9_2016bb
227 R4_2016bb
228 prop_binch2016bb_multiBins_signal_bin8
229 prop_binch2016be_multiBins_signal_bin8
230 prop_binch2016be_multiBins_control_bin4
231 prop_binch2017bb_multiBins_signal_bin8_mu_DY_S9
232 R9_2018bb
233 R3_2016be
234 prop_binch2016bb_multiBins_signal_bin2
235 prop_binch2018be_multiBins_signal_bin3
236 prop_binch2016be_multiBins_control_bin2
237 R6_2016bb
238 R5_2016bb
239 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S1
240 prop_binch2016be_multiBins_control_bin5
−2
−1
0
1
2
−0.1
−0.05
0
0.05
0.1
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin8


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin8 = 0.42 +0.17 −0.13
241 prop_binch2017be_multiBins_signal_bin1
242 R3_2016bb
243 prop_binch2017bb_multiBins_signal_bin8_mu_DY_S0
244 prop_binch2016be_multiBins_signal_bin2
245 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S7
246 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S0
247 prop_binch2016bb_multiBins_signal_bin5
248 _2016bb_Smear
249 _Smear
250 prop_binch2016bb_multiBins_signal_bin4
251 _2016be_Smear
−2 −1 0 1 2
−0.04 −0.02 0 0.02 0.04
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin8