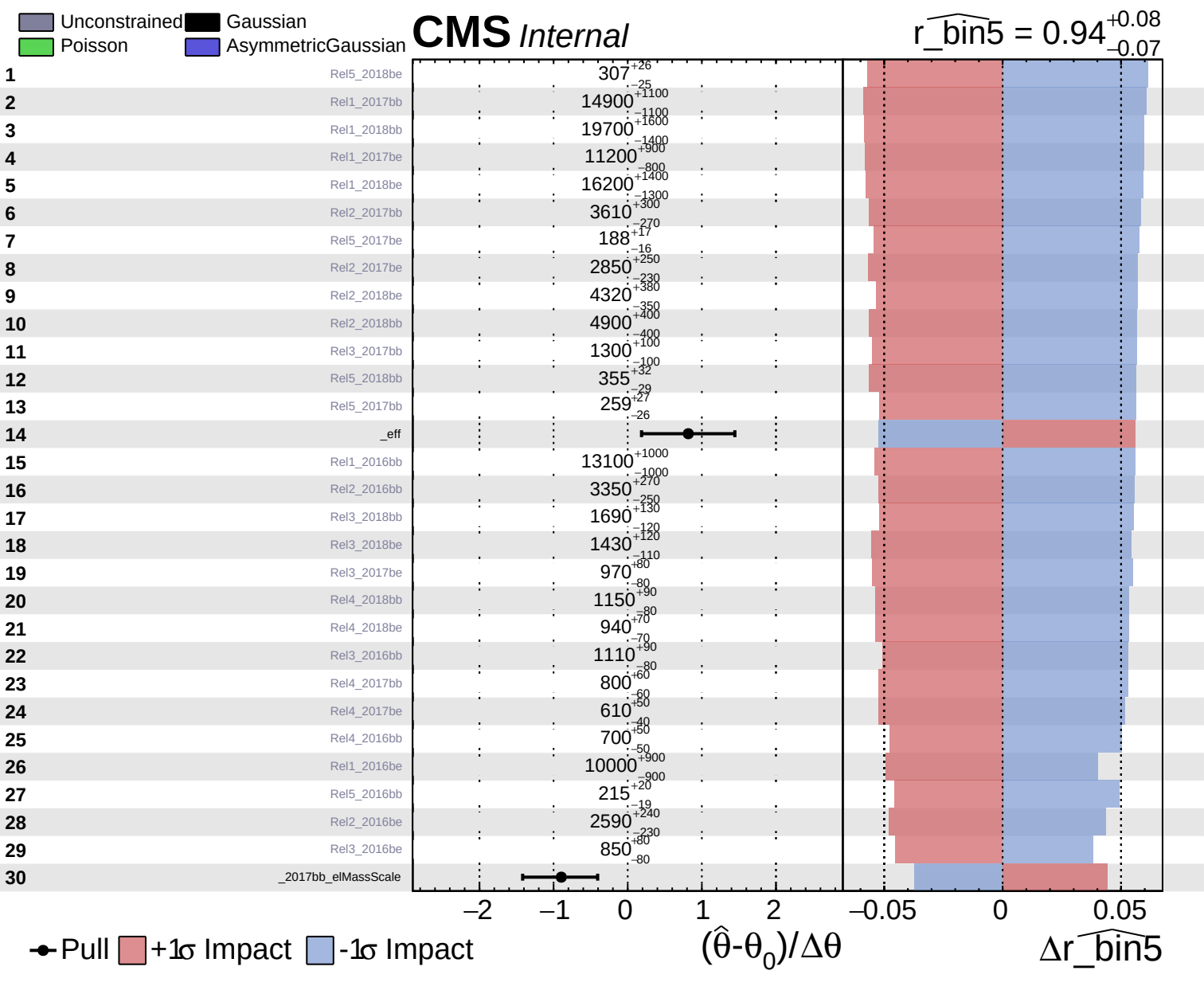
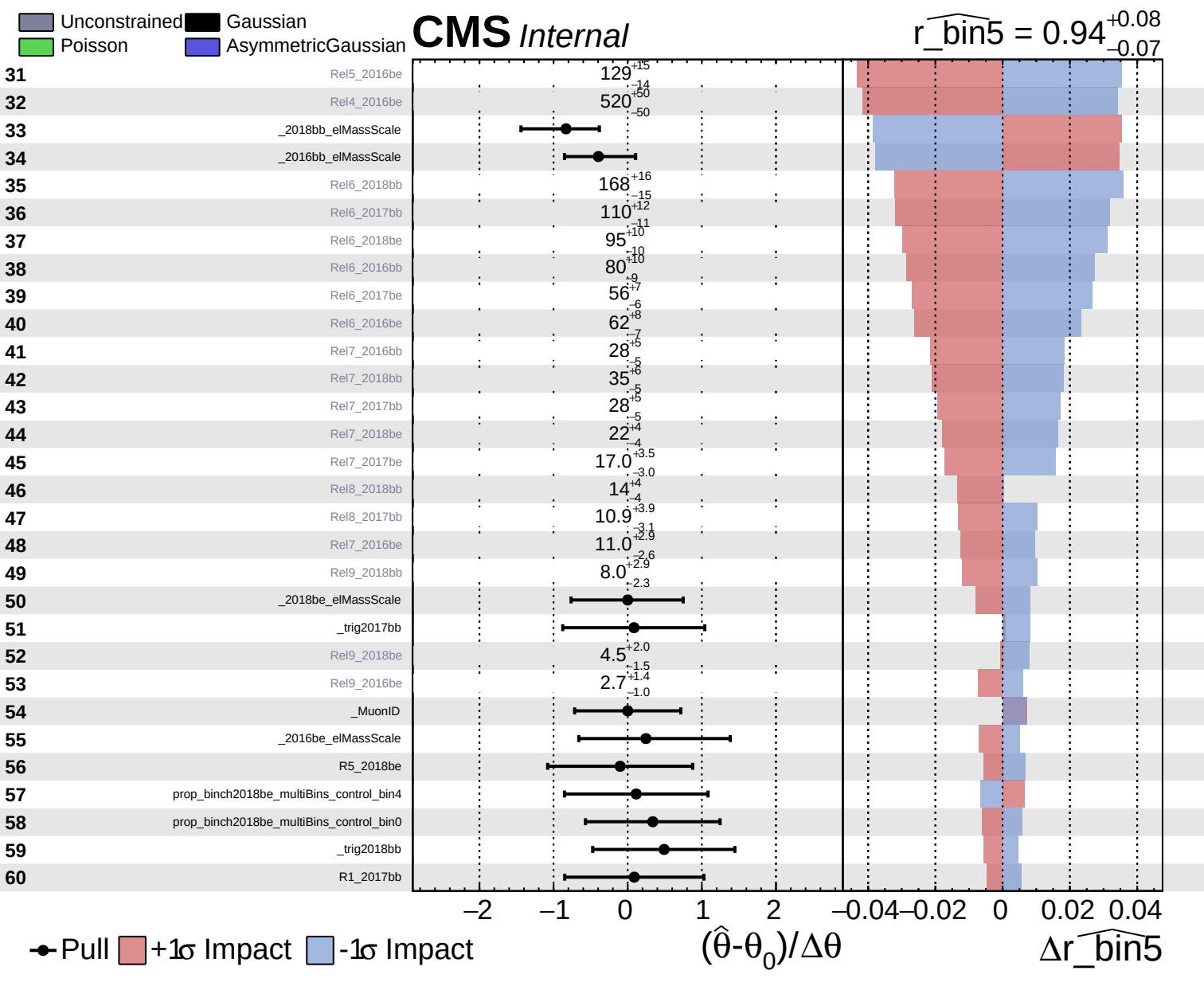
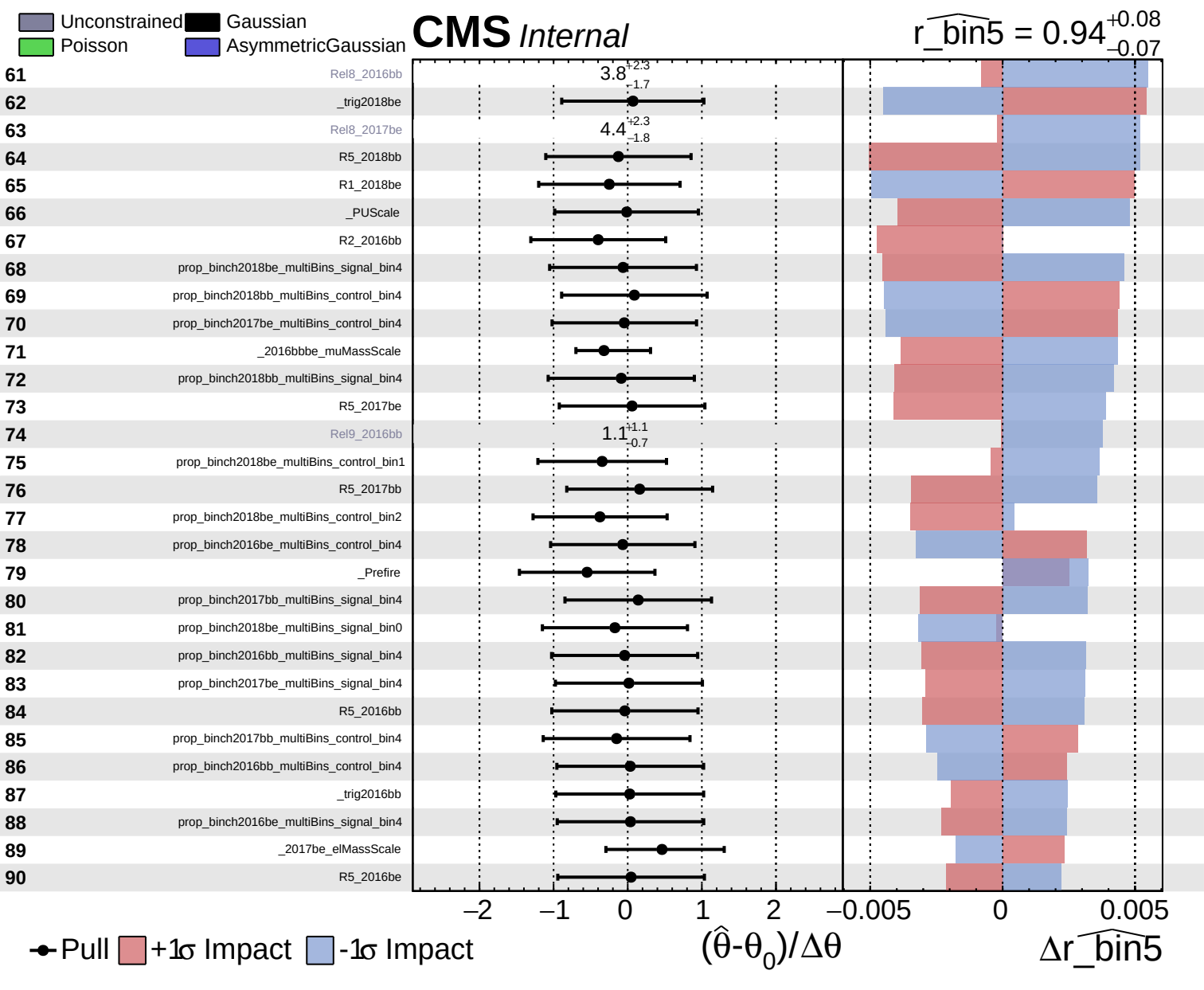
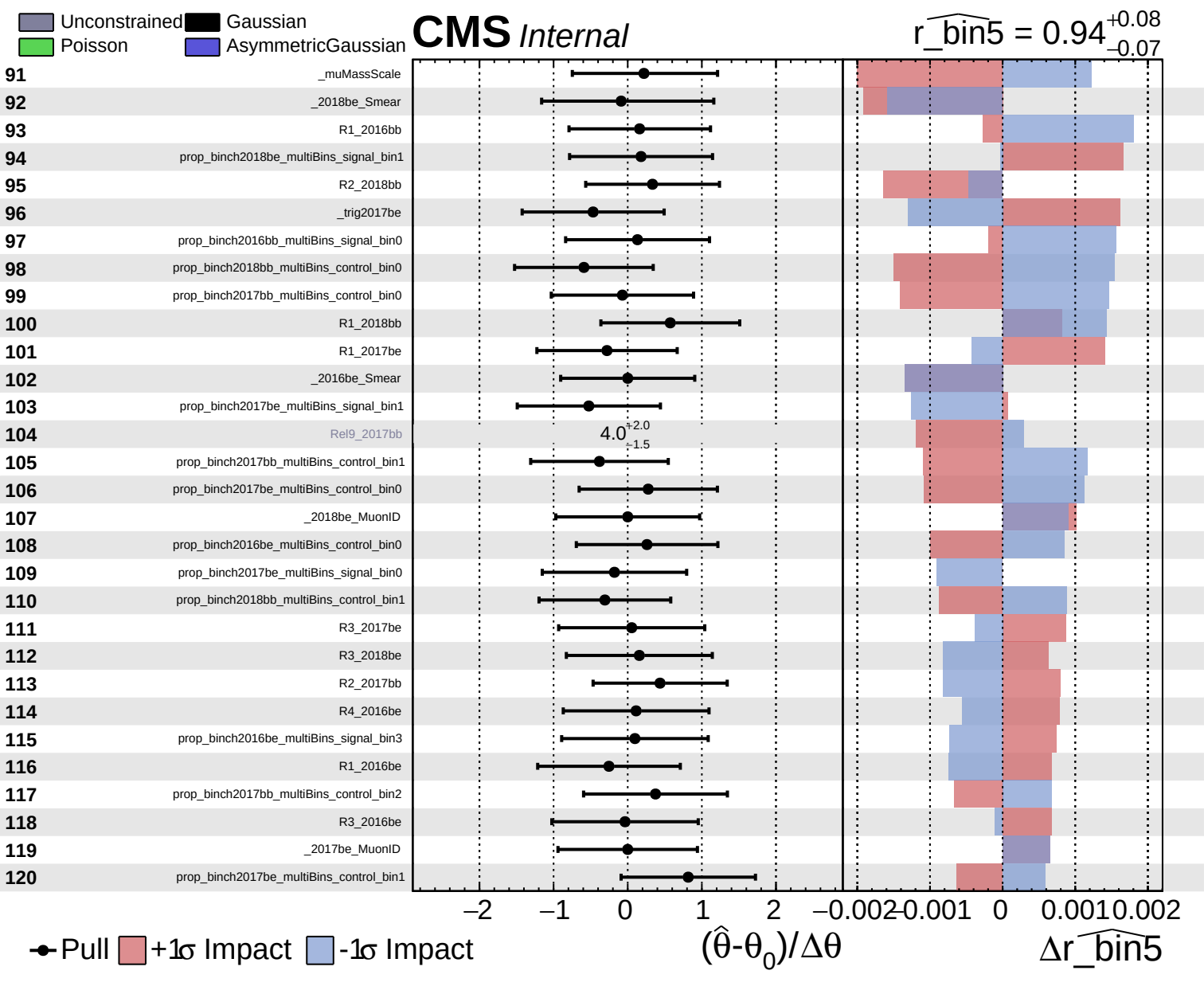
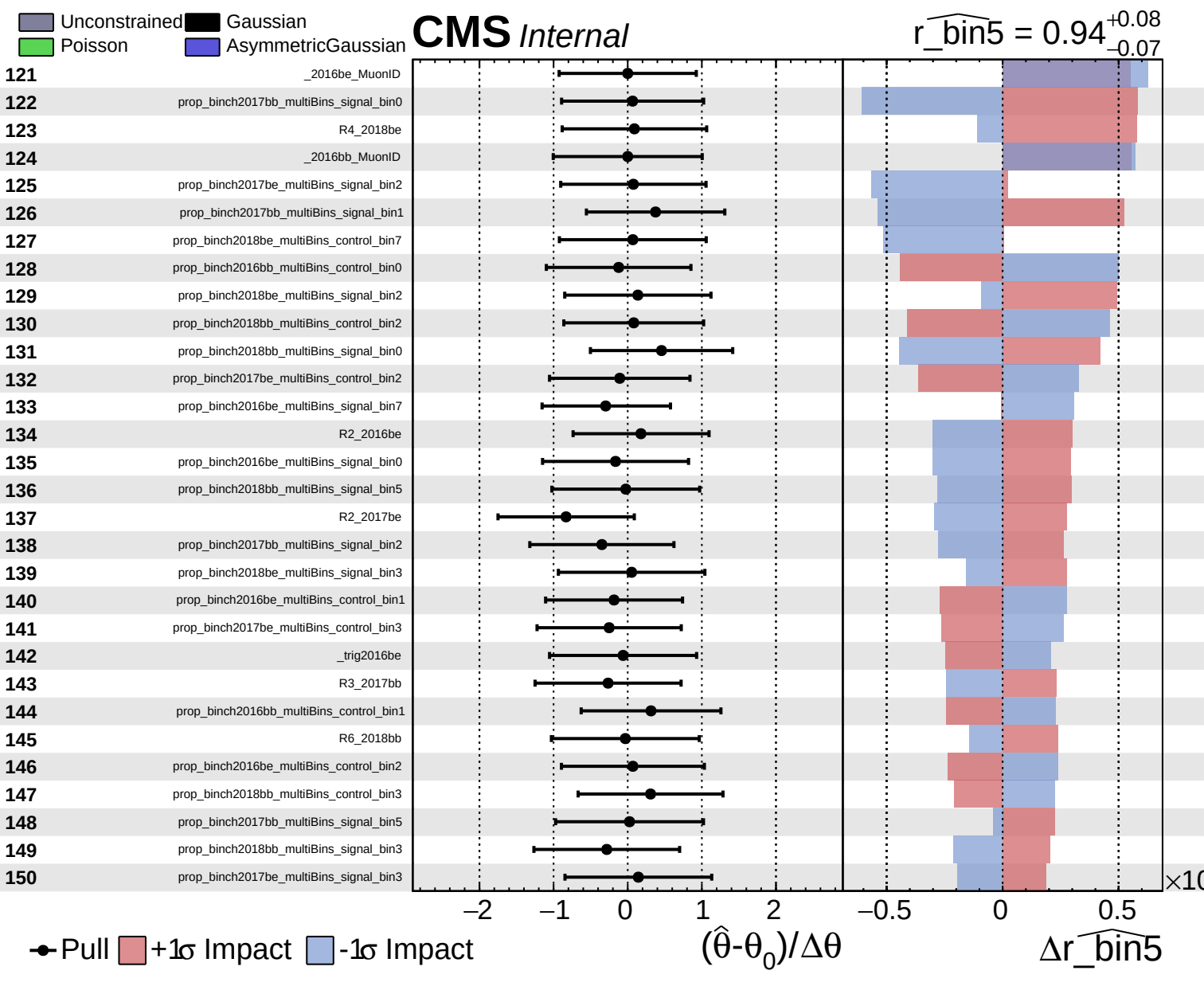
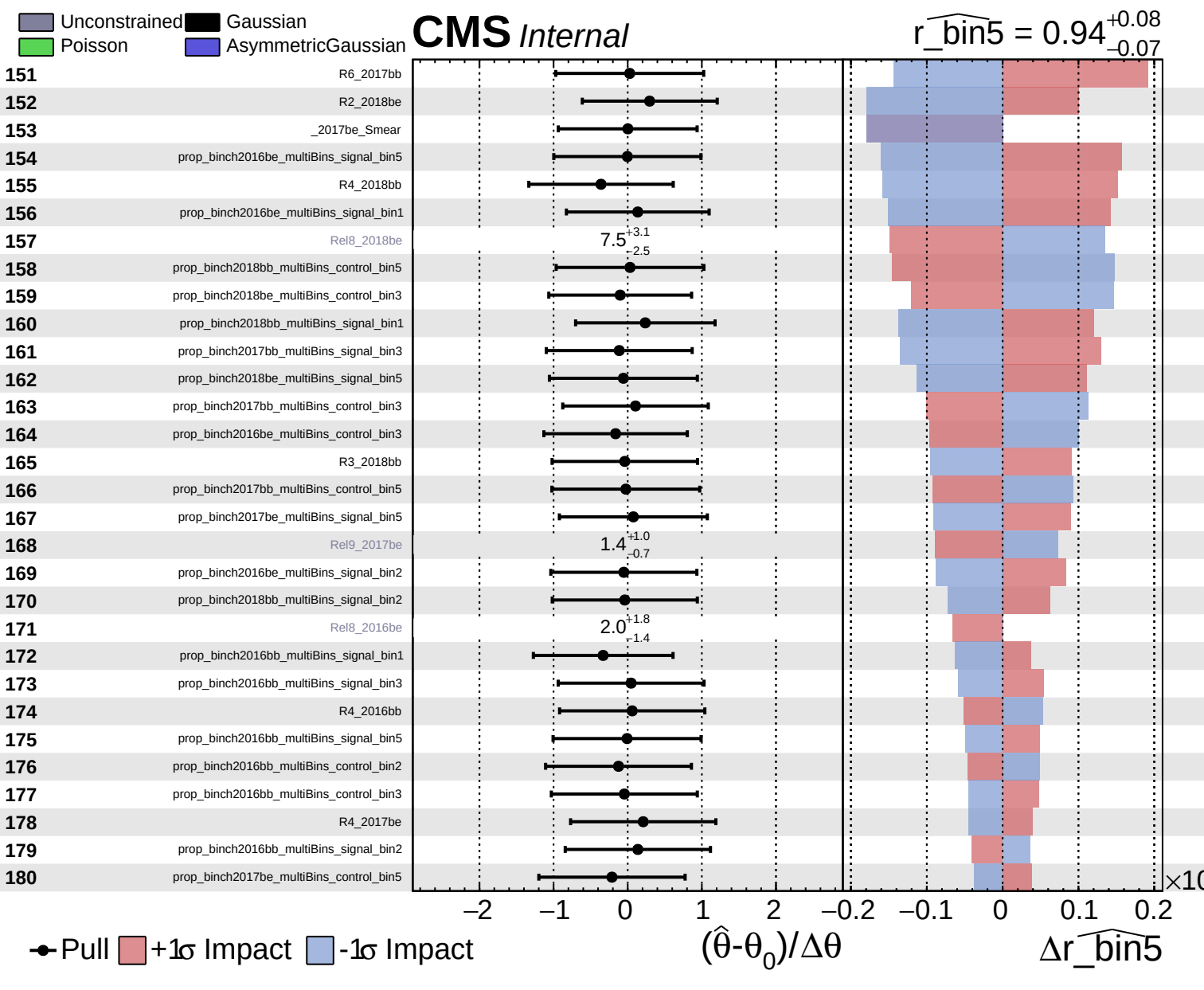

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin5 = 0.94 +0.08 −0.07
1 Rel5_2018be 307 +26 −25
2 Rel1_2017bb 14900 +1100 −1100
3 Rel1_2018bb 19700 +1600 −1400
4 Rel1_2017be 11200 +900 −800
5 Rel1_2018be 16200 +1400 −1300
6 Rel2_2017bb 3610 +300 −270
7 Rel5_2017be 188 +17 −16
8 Rel2_2017be 2850 +250 −230
9 Rel2_2018be 4320 +380 −350
10 Rel2_2018bb 4900 +400 −400
11 Rel3_2017bb 1300 +100 −100
12 Rel5_2018bb 355 +32 −29
13 Rel5_2017bb 259 +27 −26
14 _eff
15 Rel1_2016bb 13100 +1000 −1000
16 Rel2_2016bb 3350 +270 −250
17 Rel3_2018bb 1690 +130 −120
18 Rel3_2018be 1430 +120 −110
19 Rel3_2017be 970 +80 −80
20 Rel4_2018bb 1150 +90 −80
21 Rel4_2018be 940 +70 −70
22 Rel3_2016bb 1110 +90 −80
23 Rel4_2017bb 800 +60 −60
24 Rel4_2017be 610 +50 −40
25 Rel4_2016bb 700 +50 −50
26 Rel1_2016be 10000 +900 −900
27 Rel5_2016bb 215 +20 −19
28 Rel2_2016be 2590 +240 −230
29 Rel3_2016be 850 +80 −80
30 _2017bb_elMassScale
−2 −1 0 1 2
−0.05 0 0.05
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr_bin5

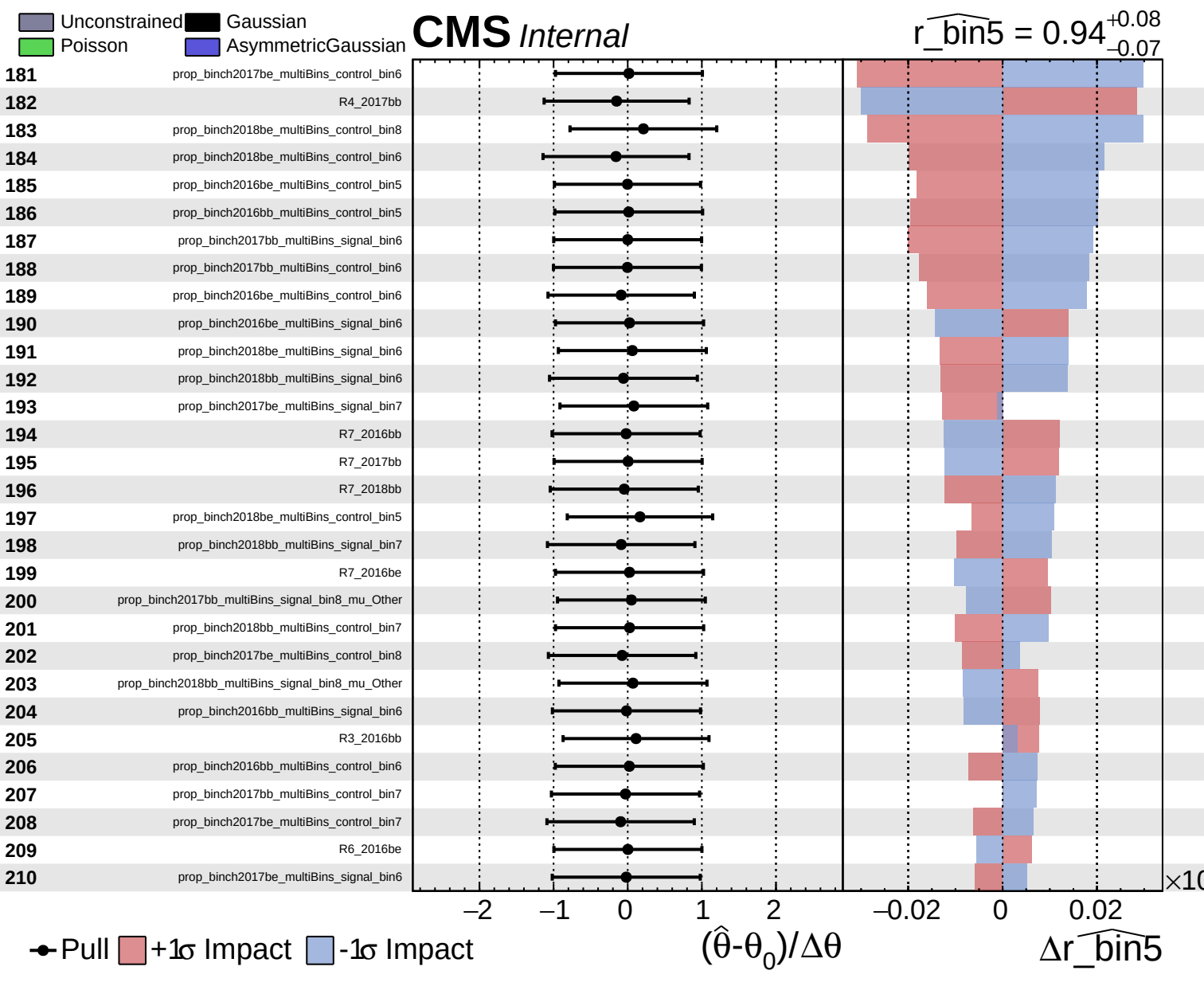

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin5 = 0.94 +0.08 −0.07
31 Rel5_2016be 129 +15 −14
32 Rel4_2016be 520 +50 −50
33 _2018bb_elMassScale
34 _2016bb_elMassScale
35 Rel6_2018bb 168 +16 −15
36 Rel6_2017bb 110 +12 −11
37 Rel6_2018be 95 +10 −10
38 Rel6_2016bb 80 +10 −9
39 Rel6_2017be 56 +7 −6
40 Rel6_2016be 62 +8 −7
41 Rel7_2016bb 28 +5 −5
42 Rel7_2018bb 35 +6 −5
43 Rel7_2017bb 28 +5 −5
44 Rel7_2018be 22 +4 −4
45 Rel7_2017be 17.0 +3.5 −3.0
46 Rel8_2018bb 14 +4 −4
47 Rel8_2017bb 10.9 +3.9 −3.1
48 Rel7_2016be 11.0 +2.9 −2.6
49 Rel9_2018bb 8.0 +2.9 −2.3
50 _2018be_elMassScale
51 _trig2017bb
52 Rel9_2018be 4.5 +2.0 −1.5
53 Rel9_2016be 2.7 +1.4 −1.0
54 _MuonID
55 _2016be_elMassScale
56 R5_2018be
57 prop_binch2018be_multiBins_control_bin4
58 prop_binch2018be_multiBins_control_bin0
59 _trig2018bb
60 R1_2017bb
−2 −1 0 1 2
−0.04 −0.02 0 0.02 0.04
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin5

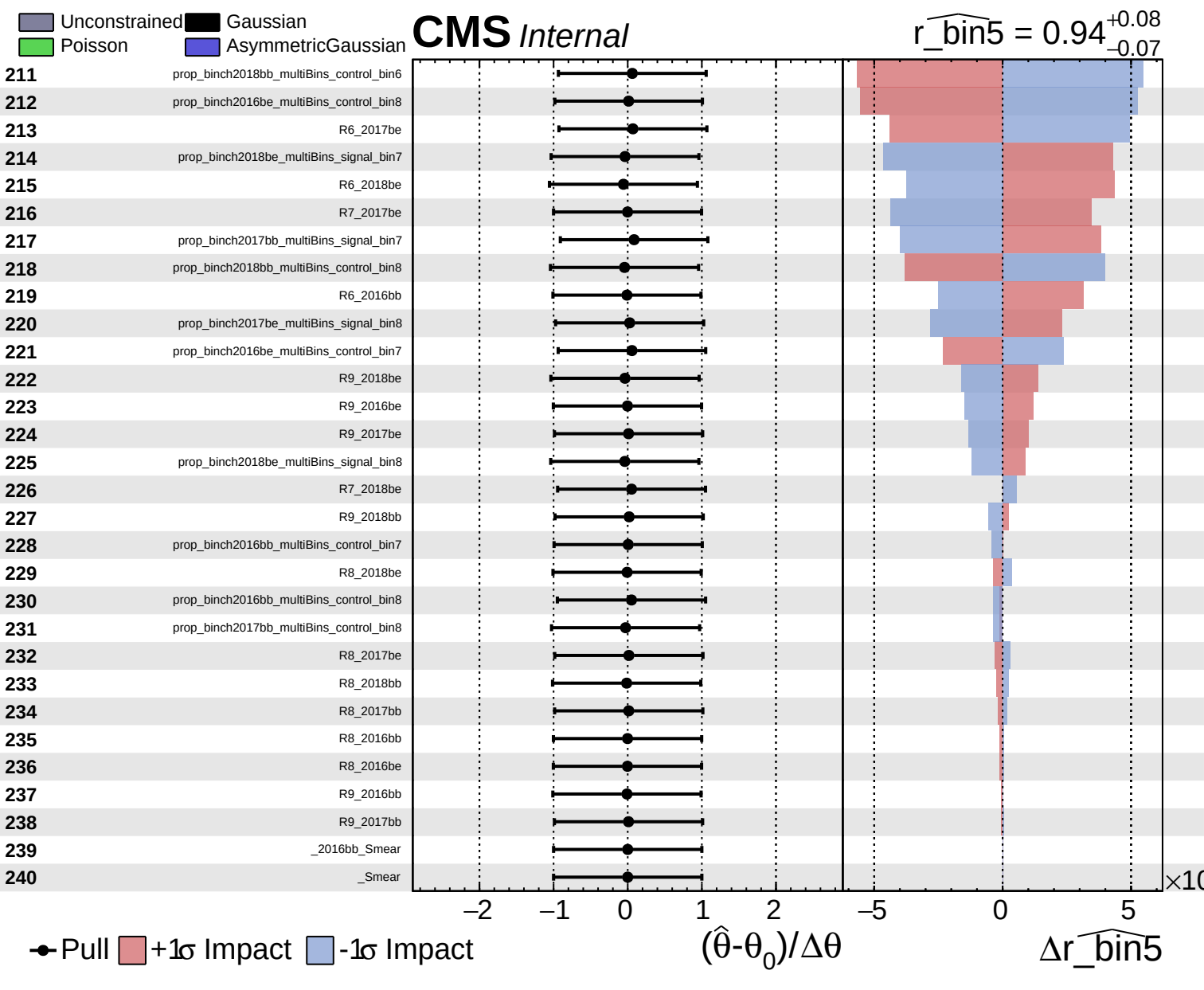

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin5 = 0.94 +0.08 −0.07
61 Rel8_2016bb
62 _trig2018be
63 Rel8_2017be
64 R5_2018bb
65 R1_2018be
66 _PUScale
67 R2_2016bb
68 prop_binch2018be_multiBins_signal_bin4
69 prop_binch2018bb_multiBins_control_bin4
70 prop_binch2017be_multiBins_control_bin4
71 _2016bbbe_muMassScale
72 prop_binch2018bb_multiBins_signal_bin4
73 R5_2017be
74 Rel9_2016bb
75 prop_binch2018be_multiBins_control_bin1
76 R5_2017bb
77 prop_binch2018be_multiBins_control_bin2
78 prop_binch2016be_multiBins_control_bin4
79 _Prefire
80 prop_binch2017bb_multiBins_signal_bin4
81 prop_binch2018be_multiBins_signal_bin0
82 prop_binch2016bb_multiBins_signal_bin4
83 prop_binch2017be_multiBins_signal_bin4
84 R5_2016bb
85 prop_binch2017bb_multiBins_control_bin4
86 prop_binch2016bb_multiBins_control_bin4
87 _trig2016bb
88 prop_binch2016be_multiBins_signal_bin4
89 _2017be_elMassScale
90 R5_2016be
3.8 +2.3 −1.7
4.4 +2.3 −1.8
1.1 +1.1 −0.7
−2
−1
0
1
2
−0.005
0
0.005
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin5

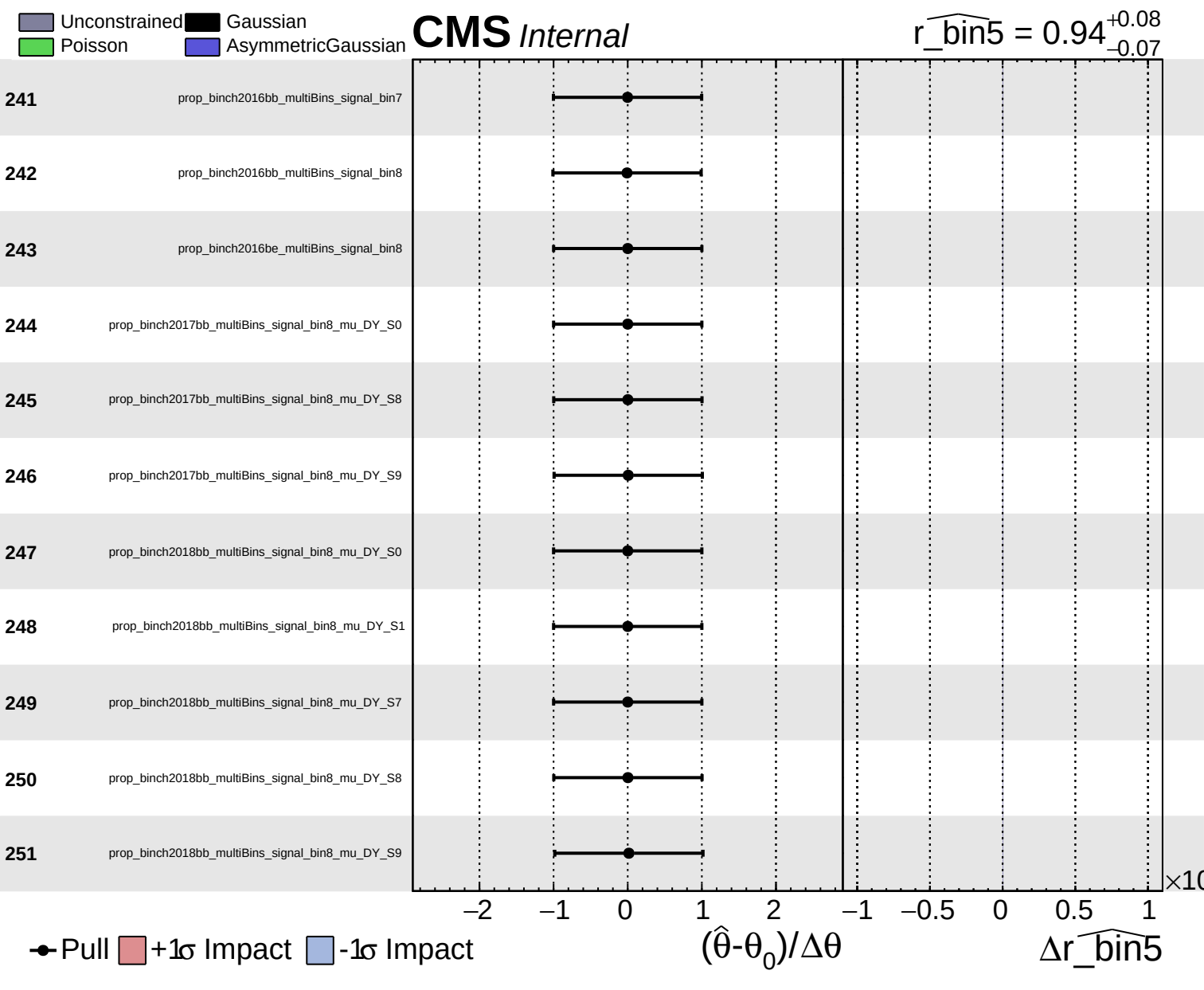

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin5 = 0.94 +0.08 −0.07
91 _muMassScale
92 _2018be_Smear
93 R1_2016bb
94 prop_binch2018be_multiBins_signal_bin1
95 R2_2018bb
96 _trig2017be
97 prop_binch2016bb_multiBins_signal_bin0
98 prop_binch2018bb_multiBins_control_bin0
99 prop_binch2017bb_multiBins_control_bin0
100 R1_2018bb
101 R1_2017be
102 _2016be_Smear
103 prop_binch2017be_multiBins_signal_bin1
104 Rel9_2017bb
4.0 +2.0 −1.5
105 prop_binch2017bb_multiBins_control_bin1
106 prop_binch2017be_multiBins_control_bin0
107 _2018be_MuonID
108 prop_binch2016be_multiBins_control_bin0
109 prop_binch2017be_multiBins_signal_bin0
110 prop_binch2018bb_multiBins_control_bin1
111 R3_2017be
112 R3_2018be
113 R2_2017bb
114 R4_2016be
115 prop_binch2016be_multiBins_signal_bin3
116 R1_2016be
117 prop_binch2017bb_multiBins_control_bin2
118 R3_2016be
119 _2017be_MuonID
120 prop_binch2017be_multiBins_control_bin1
−2 −1 0 1 2
−0.002 −0.001 0 0.001 0.002
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr_bin5


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin5 = 0.94 +0.08 −0.07
121 _2016be_MuonID
122 prop_binch2017bb_multiBins_signal_bin0
123 R4_2018be
124 _2016bb_MuonID
125 prop_binch2017be_multiBins_signal_bin2
126 prop_binch2017bb_multiBins_signal_bin1
127 prop_binch2018be_multiBins_control_bin7
128 prop_binch2016bb_multiBins_control_bin0
129 prop_binch2018be_multiBins_signal_bin2
130 prop_binch2018bb_multiBins_control_bin2
131 prop_binch2018bb_multiBins_signal_bin0
132 prop_binch2017be_multiBins_control_bin2
133 prop_binch2016be_multiBins_signal_bin7
134 R2_2016be
135 prop_binch2016be_multiBins_signal_bin0
136 prop_binch2018bb_multiBins_signal_bin5
137 R2_2017be
138 prop_binch2017bb_multiBins_signal_bin2
139 prop_binch2018be_multiBins_signal_bin3
140 prop_binch2016be_multiBins_control_bin1
141 prop_binch2017be_multiBins_control_bin3
142 _trig2016be
143 R3_2017bb
144 prop_binch2016bb_multiBins_control_bin1
145 R6_2018bb
146 prop_binch2016be_multiBins_control_bin2
147 prop_binch2018bb_multiBins_control_bin3
148 prop_binch2017bb_multiBins_signal_bin5
149 prop_binch2018bb_multiBins_signal_bin3
150 prop_binch2017be_multiBins_signal_bin3
−2 −1 0 1 2
−0.5 0 0.5
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin5


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin5 = 0.94 +0.08 −0.07
151 R6_2017bb
152 R2_2018be
153 _2017be_Smear
154 prop_binch2016be_multiBins_signal_bin5
155 R4_2018bb
156 prop_binch2016be_multiBins_signal_bin1
157 Rel8_2018be
7.5 +3.1 −2.5
158 prop_binch2018bb_multiBins_control_bin5
159 prop_binch2018be_multiBins_control_bin3
160 prop_binch2018bb_multiBins_signal_bin1
161 prop_binch2017bb_multiBins_signal_bin3
162 prop_binch2018be_multiBins_signal_bin5
163 prop_binch2017bb_multiBins_control_bin3
164 prop_binch2016be_multiBins_control_bin3
165 R3_2018bb
166 prop_binch2017bb_multiBins_control_bin5
167 prop_binch2017be_multiBins_signal_bin5
168 Rel9_2017be
1.4 +1.0 −0.7
169 prop_binch2016be_multiBins_signal_bin2
170 prop_binch2018bb_multiBins_signal_bin2
171 Rel8_2016be
2.0 +1.8 −1.4
172 prop_binch2016bb_multiBins_signal_bin1
173 prop_binch2016bb_multiBins_signal_bin3
174 R4_2016bb
175 prop_binch2016bb_multiBins_signal_bin5
176 prop_binch2016bb_multiBins_control_bin2
177 prop_binch2016bb_multiBins_control_bin3
178 R4_2017be
179 prop_binch2016bb_multiBins_signal_bin2
180 prop_binch2017be_multiBins_control_bin5
−2 −1 0 1 2
−0.2 −0.1 0 0.1 0.2
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin5


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin5 = 0.94 +0.08 −0.07
181 prop_binch2017be_multiBins_control_bin6
182 R4_2017bb
183 prop_binch2018be_multiBins_control_bin8
184 prop_binch2018be_multiBins_control_bin6
185 prop_binch2016be_multiBins_control_bin5
186 prop_binch2016bb_multiBins_control_bin5
187 prop_binch2017bb_multiBins_signal_bin6
188 prop_binch2017bb_multiBins_control_bin6
189 prop_binch2016be_multiBins_control_bin6
190 prop_binch2016be_multiBins_signal_bin6
191 prop_binch2018be_multiBins_signal_bin6
192 prop_binch2018bb_multiBins_signal_bin6
193 prop_binch2017be_multiBins_signal_bin7
194 R7_2016bb
195 R7_2017bb
196 R7_2018bb
197 prop_binch2018be_multiBins_control_bin5
198 prop_binch2018bb_multiBins_signal_bin7
199 R7_2016be
200 prop_binch2017bb_multiBins_signal_bin8_mu_Other
201 prop_binch2018bb_multiBins_control_bin7
202 prop_binch2017be_multiBins_control_bin8
203 prop_binch2018bb_multiBins_signal_bin8_mu_Other
204 prop_binch2016bb_multiBins_signal_bin6
205 R3_2016bb
206 prop_binch2016bb_multiBins_control_bin6
207 prop_binch2017bb_multiBins_control_bin7
208 prop_binch2017be_multiBins_control_bin7
209 R6_2016be
210 prop_binch2017be_multiBins_signal_bin6
−2
−1
0
1
2
−0.02
0
0.02
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin5


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin5 = 0.94 +0.08 −0.07
211 prop_binch2018bb_multiBins_control_bin6
212 prop_binch2016be_multiBins_control_bin8
213 R6_2017be
214 prop_binch2018be_multiBins_signal_bin7
215 R6_2018be
216 R7_2017be
217 prop_binch2017bb_multiBins_signal_bin7
218 prop_binch2018bb_multiBins_control_bin8
219 R6_2016bb
220 prop_binch2017be_multiBins_signal_bin8
221 prop_binch2016be_multiBins_control_bin7
222 R9_2018be
223 R9_2016be
224 R9_2017be
225 prop_binch2018be_multiBins_signal_bin8
226 R7_2018be
227 R9_2018bb
228 prop_binch2016bb_multiBins_control_bin7
229 R8_2018be
230 prop_binch2016bb_multiBins_control_bin8
231 prop_binch2017bb_multiBins_control_bin8
232 R8_2017be
233 R8_2018bb
234 R8_2017bb
235 R8_2016bb
236 R8_2016be
237 R9_2016bb
238 R9_2017bb
239 _2016bb_Smear
240 _Smear
−2 −1 0 1 2
−5 0 5
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin5


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin5 = 0.94 +0.08 −0.07
241 prop_binch2016bb_multiBins_signal_bin7
242 prop_binch2016bb_multiBins_signal_bin8
243 prop_binch2016be_multiBins_signal_bin8
244 prop_binch2017bb_multiBins_signal_bin8_mu_DY_S0
245 prop_binch2017bb_multiBins_signal_bin8_mu_DY_S8
246 prop_binch2017bb_multiBins_signal_bin8_mu_DY_S9
247 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S0
248 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S1
249 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S7
250 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S8
251 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S9
−2 −1 0 1 2
−1 −0.5 0 0.5 1
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin5