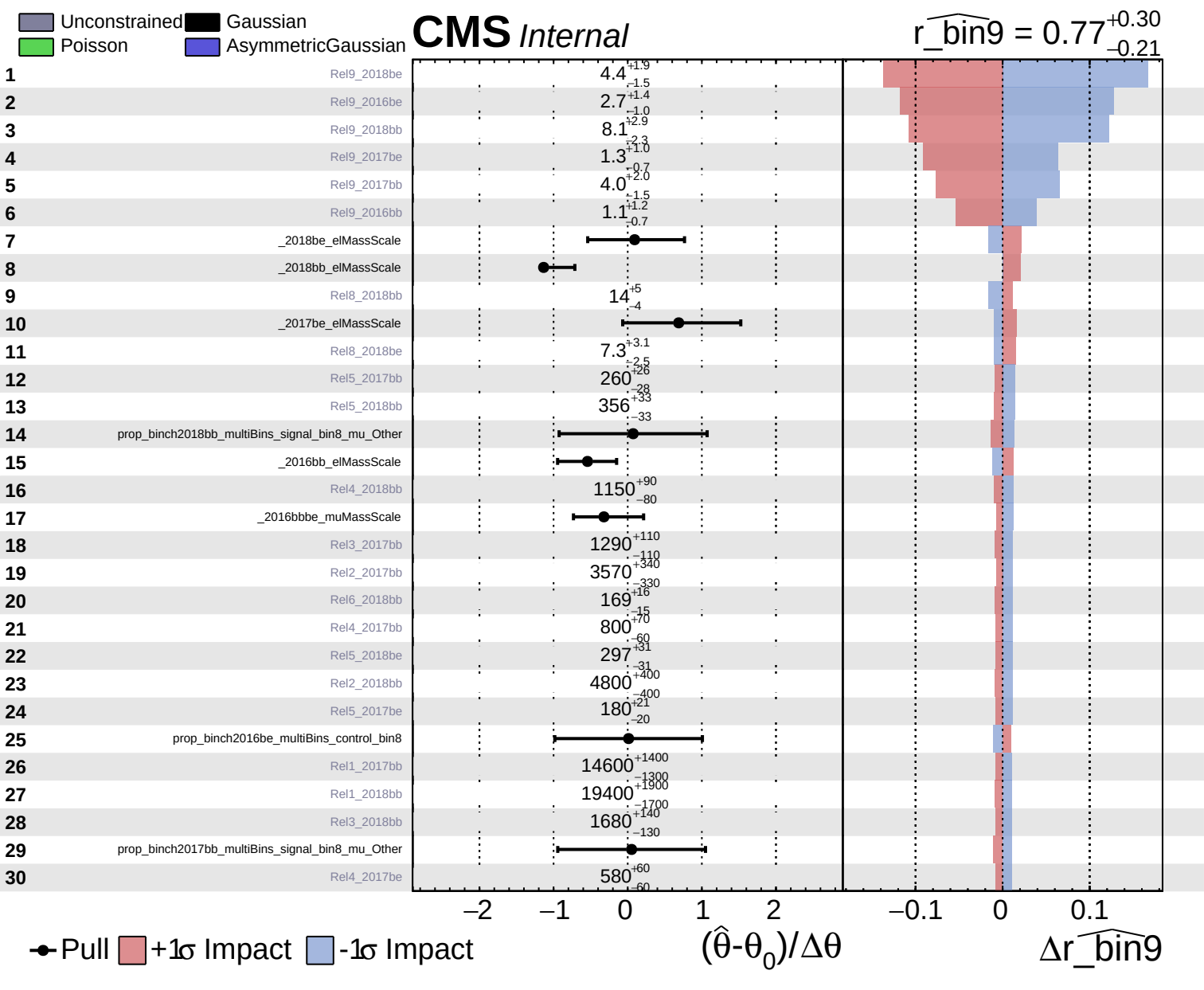
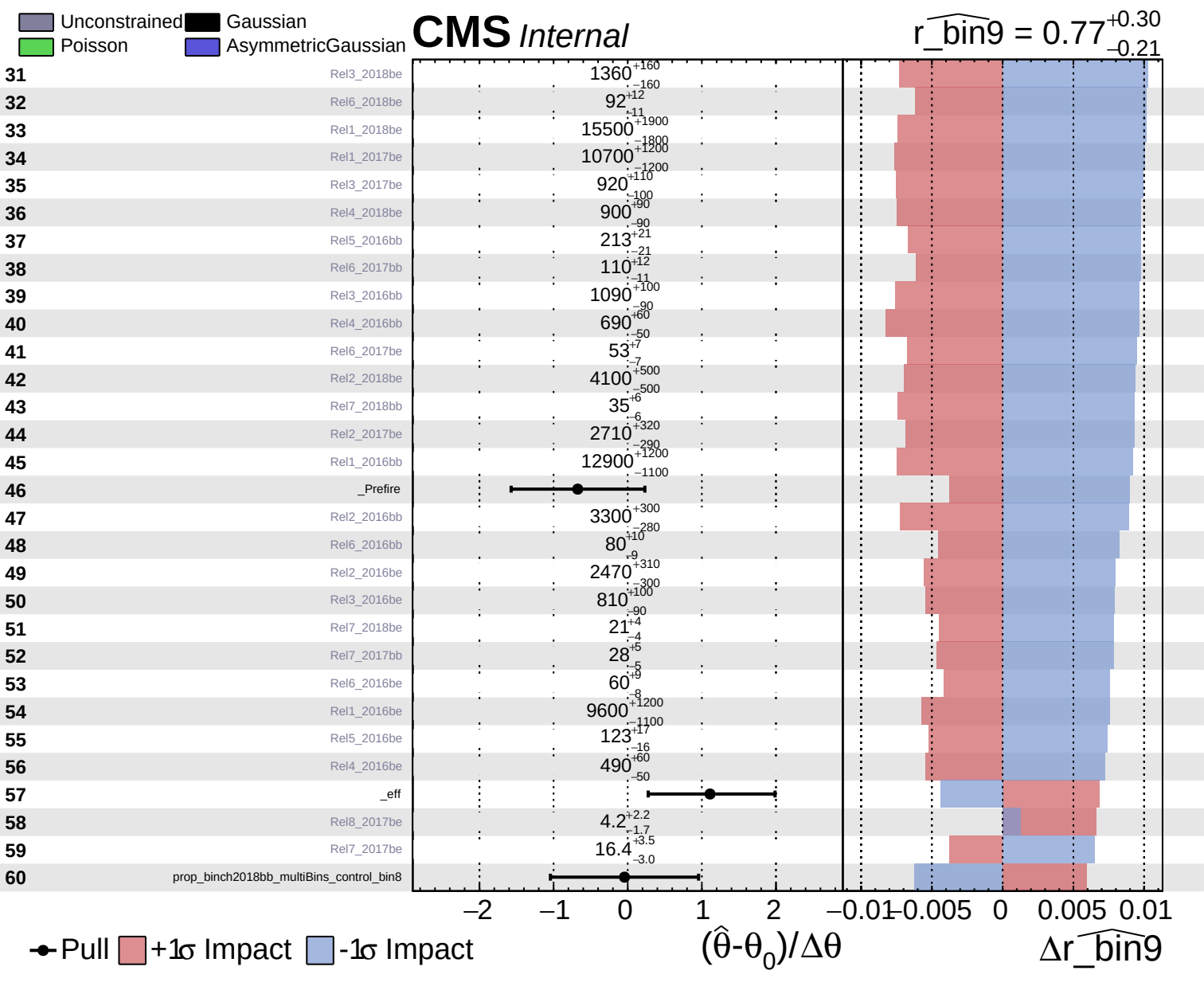
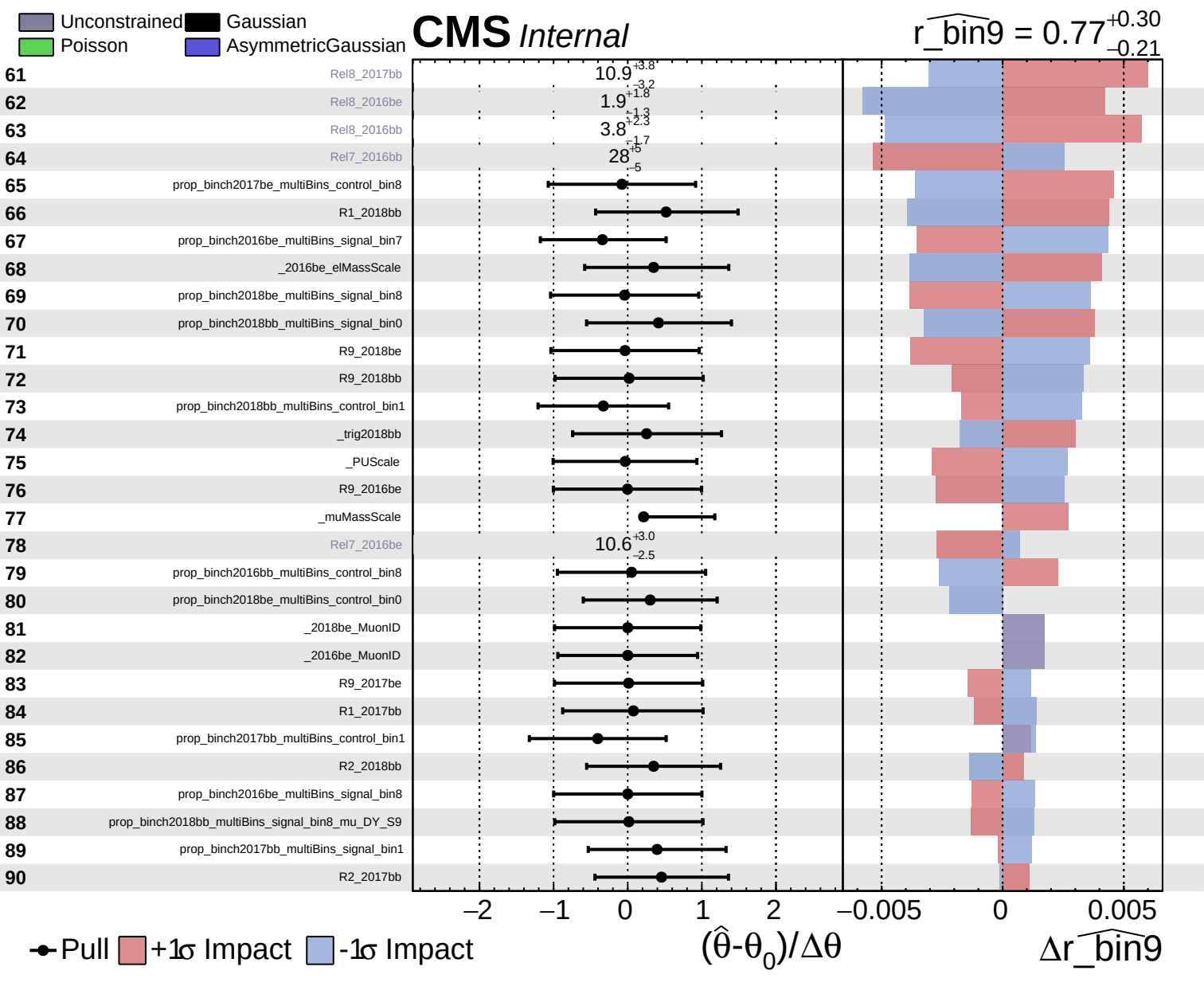
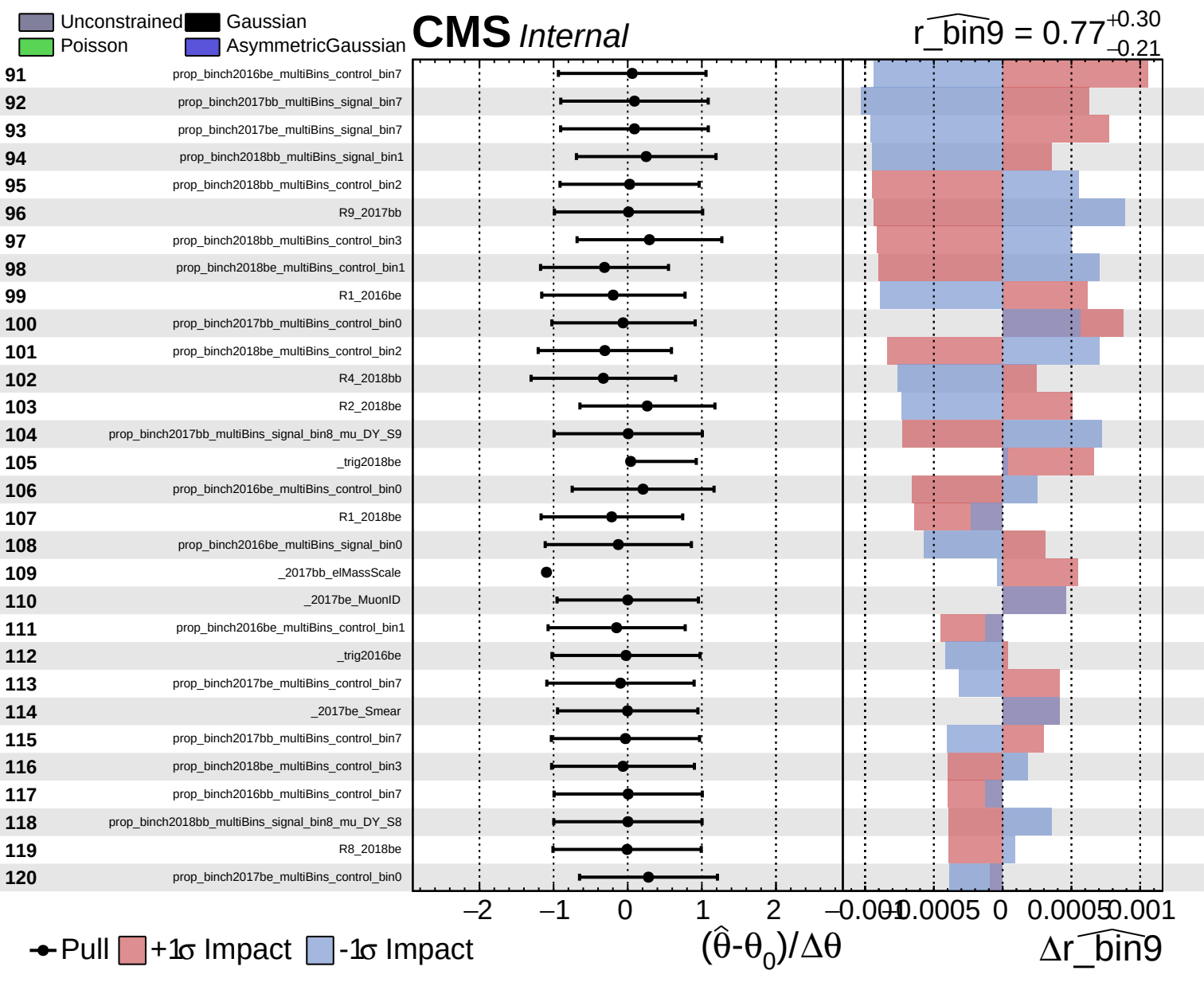
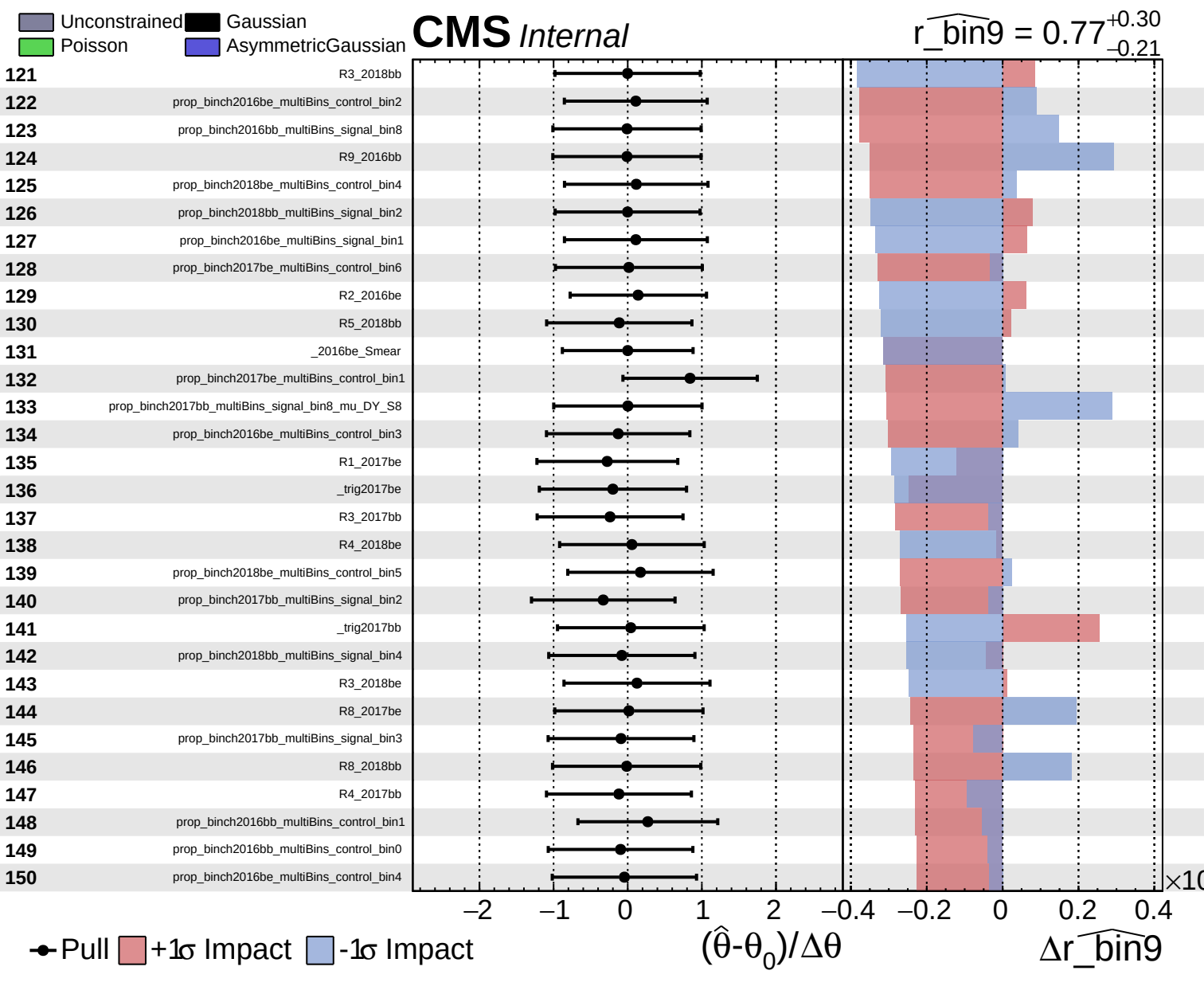
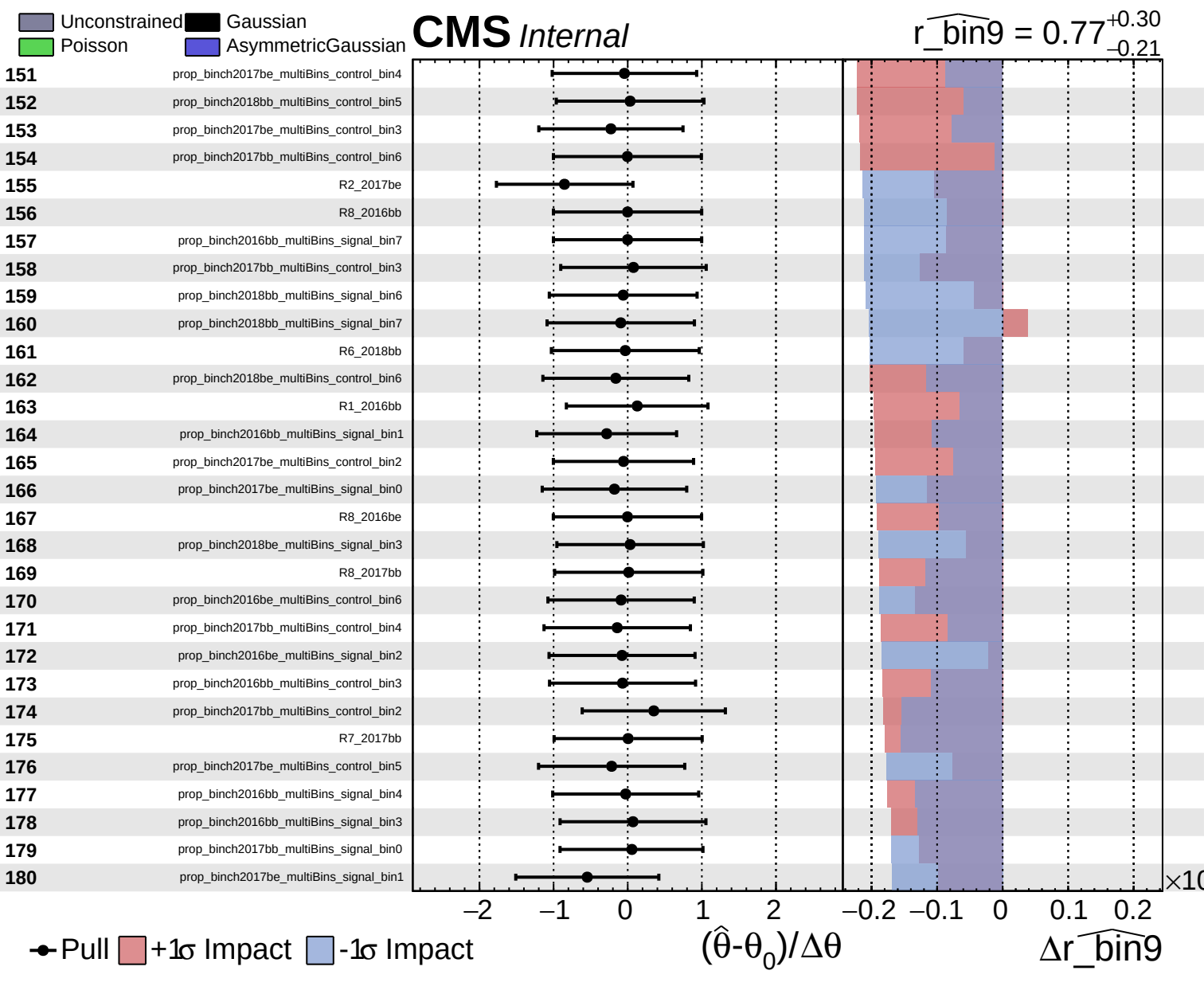

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin9 = 0.77 +0.30 −0.21
1 Rel9_2018be 4.4 +1.9 −1.5
2 Rel9_2016be 2.7 +1.4 −1.0
3 Rel9_2018bb 8.1 +2.9 −2.3
4 Rel9_2017be 1.3 +1.0 −0.7
5 Rel9_2017bb 4.0 +2.0 −1.5
6 Rel9_2016bb 1.1 +1.2 −0.7
7 _2018be_elMassScale
8 _2018bb_elMassScale
9 Rel8_2018bb 14 +5 −4
10 _2017be_elMassScale
11 Rel8_2018be 7.3 +3.1 −2.5
12 Rel5_2017bb 260 +26 −28
13 Rel5_2018bb 356 +33 −33
14 prop_binch2018bb_multiBins_signal_bin8_mu_Other
15 _2016bb_elMassScale
16 Rel4_2018bb 1150 +90 −80
17 _2016bbbe_muMassScale
18 Rel3_2017bb 1290 +110 −110
19 Rel2_2017bb 3570 +340 −330
20 Rel6_2018bb 169 +16 −15
21 Rel4_2017bb 800 +70 −60
22 Rel5_2018be 297 +31 −31
23 Rel2_2018bb 4800 +400 −400
24 Rel5_2017be 180 +21 −20
25 prop_binch2016be_multiBins_control_bin8
26 Rel1_2017bb 14600 +1400 −1300
27 Rel1_2018bb 19400 +1900 −1700
28 Rel3_2018bb 1680 +140 −130
29 prop_binch2017bb_multiBins_signal_bin8_mu_Other
30 Rel4_2017be 580 +60 −60
−2 −1 0 1 2
−0.1 0 0.1
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr_bin9

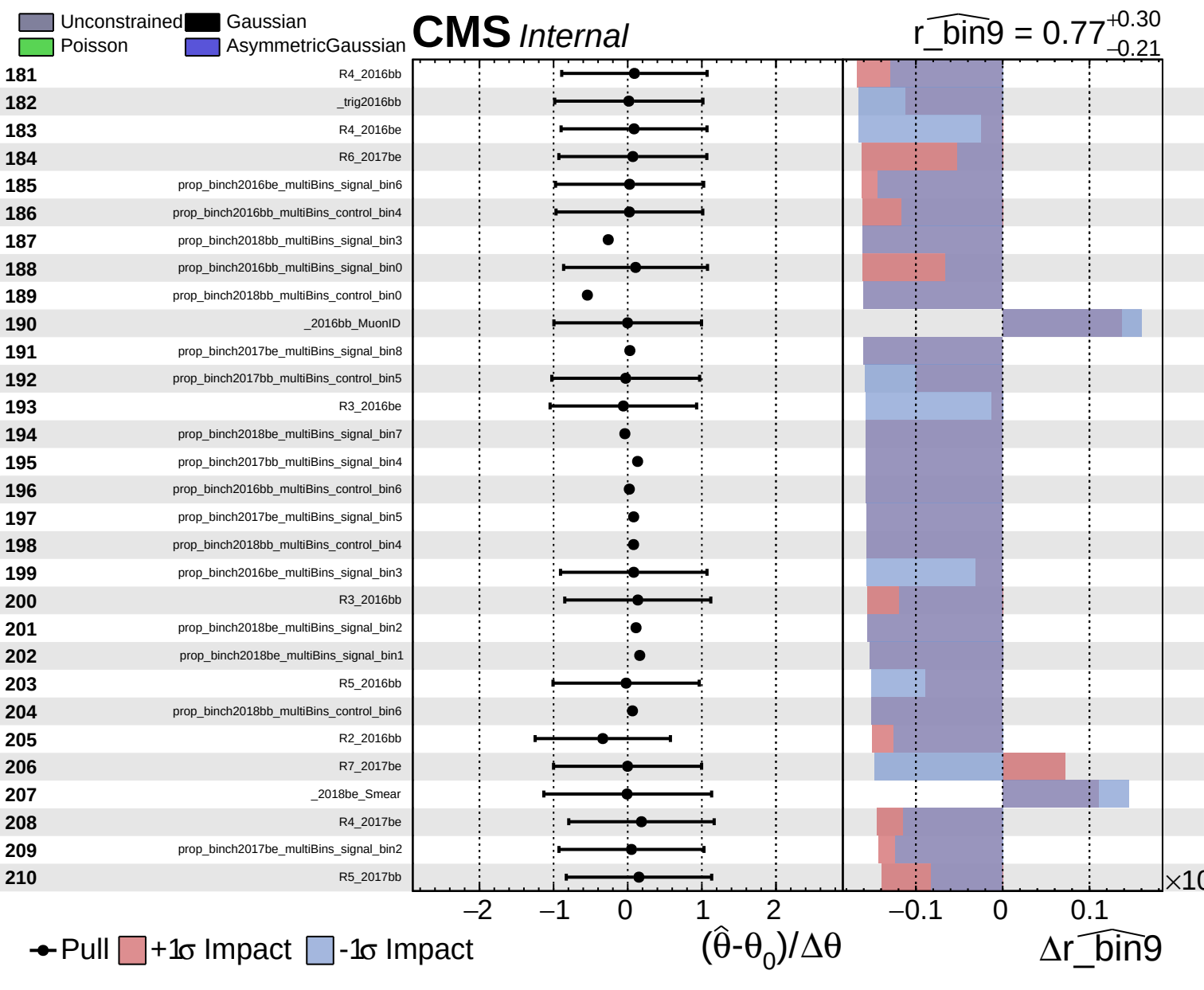

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin9 = 0.77 +0.30 −0.21
31 Rel3_2018be 1360 +160 −160
32 Rel6_2018be 92 +12 −11
33 Rel1_2018be 15500 +1900 −1800
34 Rel1_2017be 10700 +1200 −1200
35 Rel3_2017be 920 +110 −100
36 Rel4_2018be 900 +90 −90
37 Rel5_2016bb 213 +21 −21
38 Rel6_2017bb 110 +12 −11
39 Rel3_2016bb 1090 +100 −90
40 Rel4_2016bb 690 +60 −50
41 Rel6_2017be 53 +7 −7
42 Rel2_2018be 4100 +500 −500
43 Rel7_2018bb 35 +6 −6
44 Rel2_2017be 2710 +320 −290
45 Rel1_2016bb 12900 +1200 −1100
46 _Prefire
47 Rel2_2016bb 3300 +300 −280
48 Rel6_2016bb 80 +10 −9
49 Rel2_2016be 2470 +310 −300
50 Rel3_2016be 810 +100 −90
51 Rel7_2018be 21 +4 −4
52 Rel7_2017bb 28 +5 −5
53 Rel6_2016be 60 +9 −8
54 Rel1_2016be 9600 +1200 −1100
55 Rel5_2016be 123 +17 −16
56 Rel4_2016be 490 +60 −50
57 _eff
58 Rel8_2017be 4.2 +2.2 −1.7
59 Rel7_2017be 16.4 +3.5 −3.0
60 prop_binch2018bb_multiBins_control_bin8
−2 −1 0 1 2
−0.01 −0.005 0 0.005 0.01
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin9

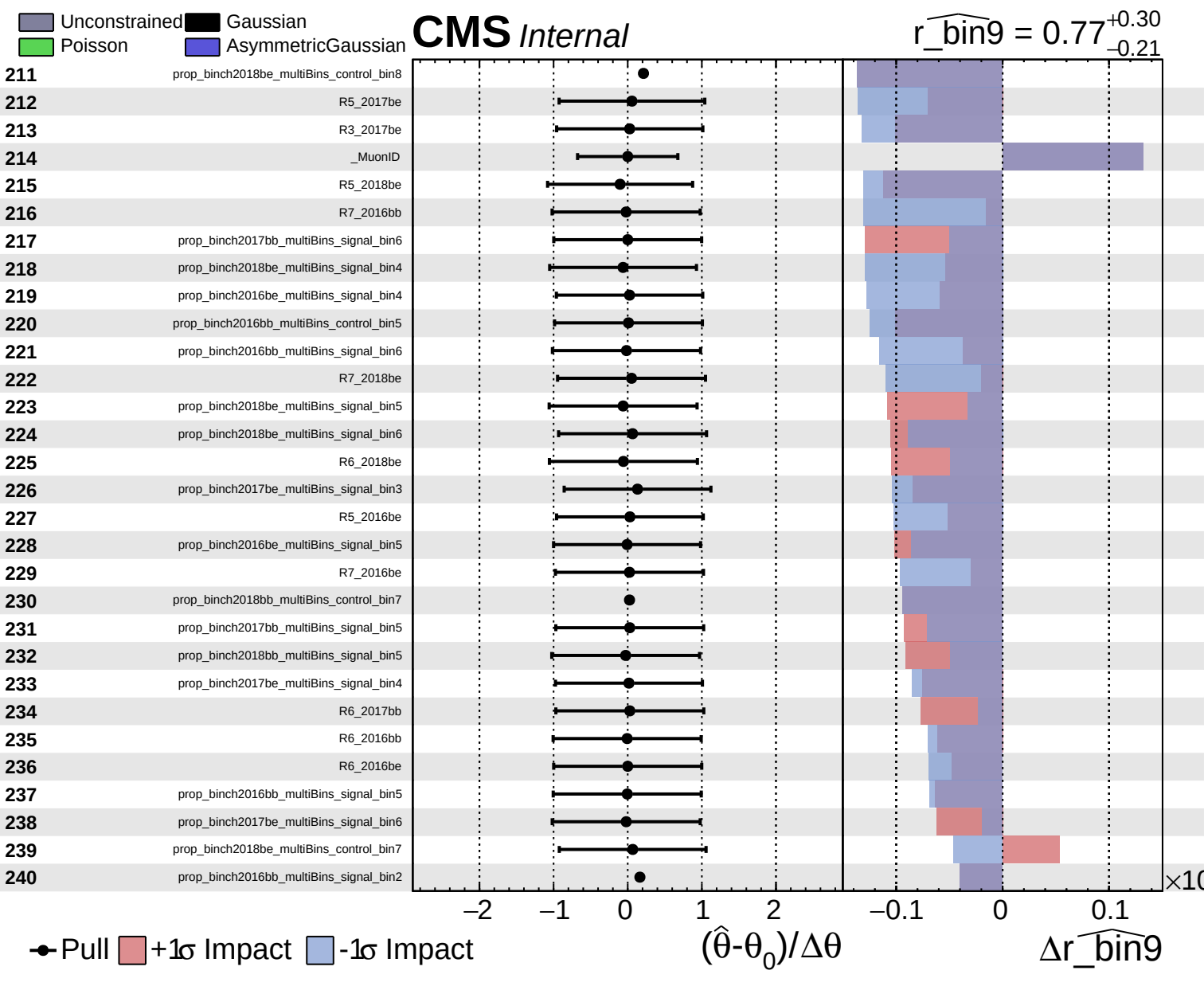

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin9 = 0.77 +0.30 −0.21
61 Rel8_2017bb 10.9 +3.8 −3.2
62 Rel8_2016be 1.9 +1.8 −1.3
63 Rel8_2016bb 3.8 +2.3 −1.7
64 Rel7_2016bb 28 +5 −5
65 prop_binch2017be_multiBins_control_bin8
66 R1_2018bb
67 prop_binch2016be_multiBins_signal_bin7
68 _2016be_elMassScale
69 prop_binch2018be_multiBins_signal_bin8
70 prop_binch2018bb_multiBins_signal_bin0
71 R9_2018be
72 R9_2018bb
73 prop_binch2018bb_multiBins_control_bin1
74 _trig2018bb
75 _PUScale
76 R9_2016be
77 _muMassScale
78 Rel7_2016be 10.6 +3.0 −2.5
79 prop_binch2016bb_multiBins_control_bin8
80 prop_binch2018be_multiBins_control_bin0
81 _2018be_MuonID
82 _2016be_MuonID
83 R9_2017be
84 R1_2017bb
85 prop_binch2017bb_multiBins_control_bin1
86 R2_2018bb
87 prop_binch2016be_multiBins_signal_bin8
88 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S9
89 prop_binch2017bb_multiBins_signal_bin1
90 R2_2017bb
−2 −1 0 1 2
(θ̂-θ0)/Δθ
−0.005 0 0.005
Δr_bin9
Pull
+1σ Impact
-1σ Impact

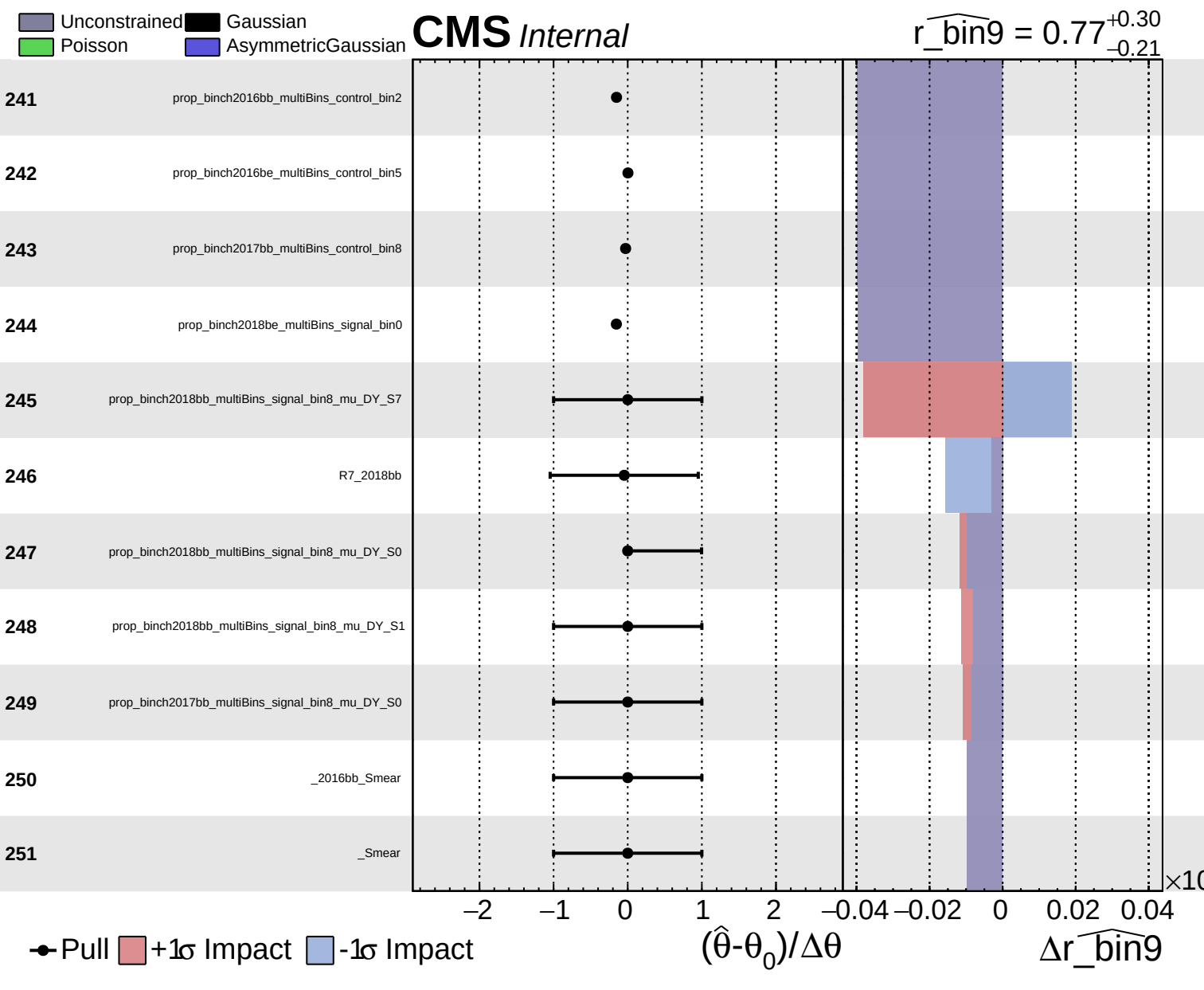

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin9 = 0.77 +0.30 −0.21
91 prop_binch2016be_multiBins_control_bin7
92 prop_binch2017bb_multiBins_signal_bin7
93 prop_binch2017be_multiBins_signal_bin7
94 prop_binch2018bb_multiBins_signal_bin1
95 prop_binch2018bb_multiBins_control_bin2
96 R9_2017bb
97 prop_binch2018bb_multiBins_control_bin3
98 prop_binch2018be_multiBins_control_bin1
99 R1_2016be
100 prop_binch2017bb_multiBins_control_bin0
101 prop_binch2018be_multiBins_control_bin2
102 R4_2018bb
103 R2_2018be
104 prop_binch2017bb_multiBins_signal_bin8_mu_DY_S9
105 _trig2018be
106 prop_binch2016be_multiBins_control_bin0
107 R1_2018be
108 prop_binch2016be_multiBins_signal_bin0
109 _2017bb_elMassScale
110 _2017be_MuonID
111 prop_binch2016be_multiBins_control_bin1
112 _trig2016be
113 prop_binch2017be_multiBins_control_bin7
114 _2017be_Smear
115 prop_binch2017bb_multiBins_control_bin7
116 prop_binch2018be_multiBins_control_bin3
117 prop_binch2016bb_multiBins_control_bin7
118 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S8
119 R8_2018be
120 prop_binch2017be_multiBins_control_bin0
−2 −1 0 1 2
−0.001 −0.0005 0 0.0005 0.001
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr_bin9


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin9 = 0.77 +0.30 −0.21
121 R3_2018bb
122 prop_binch2016be_multiBins_control_bin2
123 prop_binch2016bb_multiBins_signal_bin8
124 R9_2016bb
125 prop_binch2018be_multiBins_control_bin4
126 prop_binch2018bb_multiBins_signal_bin2
127 prop_binch2016be_multiBins_signal_bin1
128 prop_binch2017be_multiBins_control_bin6
129 R2_2016be
130 R5_2018bb
131 _2016be_Smear
132 prop_binch2017be_multiBins_control_bin1
133 prop_binch2017bb_multiBins_signal_bin8_mu_DY_S8
134 prop_binch2016be_multiBins_control_bin3
135 R1_2017be
136 _trig2017be
137 R3_2017bb
138 R4_2018be
139 prop_binch2018be_multiBins_control_bin5
140 prop_binch2017bb_multiBins_signal_bin2
141 _trig2017bb
142 prop_binch2018bb_multiBins_signal_bin4
143 R3_2018be
144 R8_2017be
145 prop_binch2017bb_multiBins_signal_bin3
146 R8_2018bb
147 R4_2017bb
148 prop_binch2016bb_multiBins_control_bin1
149 prop_binch2016bb_multiBins_control_bin0
150 prop_binch2016be_multiBins_control_bin4
−2 −1 0 1 2
−0.4 −0.2 0 0.2 0.4
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin9


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin9 = 0.77 +0.30 −0.21
151 prop_binch2017be_multiBins_control_bin4
152 prop_binch2018bb_multiBins_control_bin5
153 prop_binch2017be_multiBins_control_bin3
154 prop_binch2017bb_multiBins_control_bin6
155 R2_2017be
156 R8_2016bb
157 prop_binch2016bb_multiBins_signal_bin7
158 prop_binch2017bb_multiBins_control_bin3
159 prop_binch2018bb_multiBins_signal_bin6
160 prop_binch2018bb_multiBins_signal_bin7
161 R6_2018bb
162 prop_binch2018be_multiBins_control_bin6
163 R1_2016bb
164 prop_binch2016bb_multiBins_signal_bin1
165 prop_binch2017be_multiBins_control_bin2
166 prop_binch2017be_multiBins_signal_bin0
167 R8_2016be
168 prop_binch2018be_multiBins_signal_bin3
169 R8_2017bb
170 prop_binch2016be_multiBins_control_bin6
171 prop_binch2017bb_multiBins_control_bin4
172 prop_binch2016be_multiBins_signal_bin2
173 prop_binch2016bb_multiBins_control_bin3
174 prop_binch2017bb_multiBins_control_bin2
175 R7_2017bb
176 prop_binch2017be_multiBins_control_bin5
177 prop_binch2016bb_multiBins_signal_bin4
178 prop_binch2016bb_multiBins_signal_bin3
179 prop_binch2017bb_multiBins_signal_bin0
180 prop_binch2017be_multiBins_signal_bin1
−2 −1 0 1 2
−0.2 −0.1 0 0.1 0.2
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin9


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin9 = 0.77 +0.30 −0.21
181 R4_2016bb
182 _trig2016bb
183 R4_2016be
184 R6_2017be
185 prop_binch2016be_multiBins_signal_bin6
186 prop_binch2016bb_multiBins_control_bin4
187 prop_binch2018bb_multiBins_signal_bin3
188 prop_binch2016bb_multiBins_signal_bin0
189 prop_binch2018bb_multiBins_control_bin0
190 _2016bb_MuonID
191 prop_binch2017be_multiBins_signal_bin8
192 prop_binch2017bb_multiBins_control_bin5
193 R3_2016be
194 prop_binch2018be_multiBins_signal_bin7
195 prop_binch2017bb_multiBins_signal_bin4
196 prop_binch2016bb_multiBins_control_bin6
197 prop_binch2017be_multiBins_signal_bin5
198 prop_binch2018bb_multiBins_control_bin4
199 prop_binch2016be_multiBins_signal_bin3
200 R3_2016bb
201 prop_binch2018be_multiBins_signal_bin2
202 prop_binch2018be_multiBins_signal_bin1
203 R5_2016bb
204 prop_binch2018bb_multiBins_control_bin6
205 R2_2016bb
206 R7_2017be
207 _2018be_Smear
208 R4_2017be
209 prop_binch2017be_multiBins_signal_bin2
210 R5_2017bb
−2 −1 0 1 2
−0.1 0 0.1
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin9


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin9 = 0.77 +0.30 −0.21
211 prop_binch2018be_multiBins_control_bin8
212 R5_2017be
213 R3_2017be
214 _MuonID
215 R5_2018be
216 R7_2016bb
217 prop_binch2017bb_multiBins_signal_bin6
218 prop_binch2018be_multiBins_signal_bin4
219 prop_binch2016be_multiBins_signal_bin4
220 prop_binch2016bb_multiBins_control_bin5
221 prop_binch2016bb_multiBins_signal_bin6
222 R7_2018be
223 prop_binch2018be_multiBins_signal_bin5
224 prop_binch2018be_multiBins_signal_bin6
225 R6_2018be
226 prop_binch2017be_multiBins_signal_bin3
227 R5_2016be
228 prop_binch2016be_multiBins_signal_bin5
229 R7_2016be
230 prop_binch2018bb_multiBins_control_bin7
231 prop_binch2017bb_multiBins_signal_bin5
232 prop_binch2018bb_multiBins_signal_bin5
233 prop_binch2017be_multiBins_signal_bin4
234 R6_2017bb
235 R6_2016bb
236 R6_2016be
237 prop_binch2016bb_multiBins_signal_bin5
238 prop_binch2017be_multiBins_signal_bin6
239 prop_binch2018be_multiBins_control_bin7
240 prop_binch2016bb_multiBins_signal_bin2
−2
−1
0
1
2
−0.1
0
0.1
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin9


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin9 = 0.77 +0.30 −0.21
241
prop_binch2016bb_multiBins_control_bin2
242
prop_binch2016be_multiBins_control_bin5
243
prop_binch2017bb_multiBins_control_bin8
244
prop_binch2018be_multiBins_signal_bin0
245
prop_binch2018bb_multiBins_signal_bin8_mu_DY_S7
246
R7_2018bb
247
prop_binch2018bb_multiBins_signal_bin8_mu_DY_S0
248
prop_binch2018bb_multiBins_signal_bin8_mu_DY_S1
249
prop_binch2017bb_multiBins_signal_bin8_mu_DY_S0
250
_2016bb_Smear
251
_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_bin9