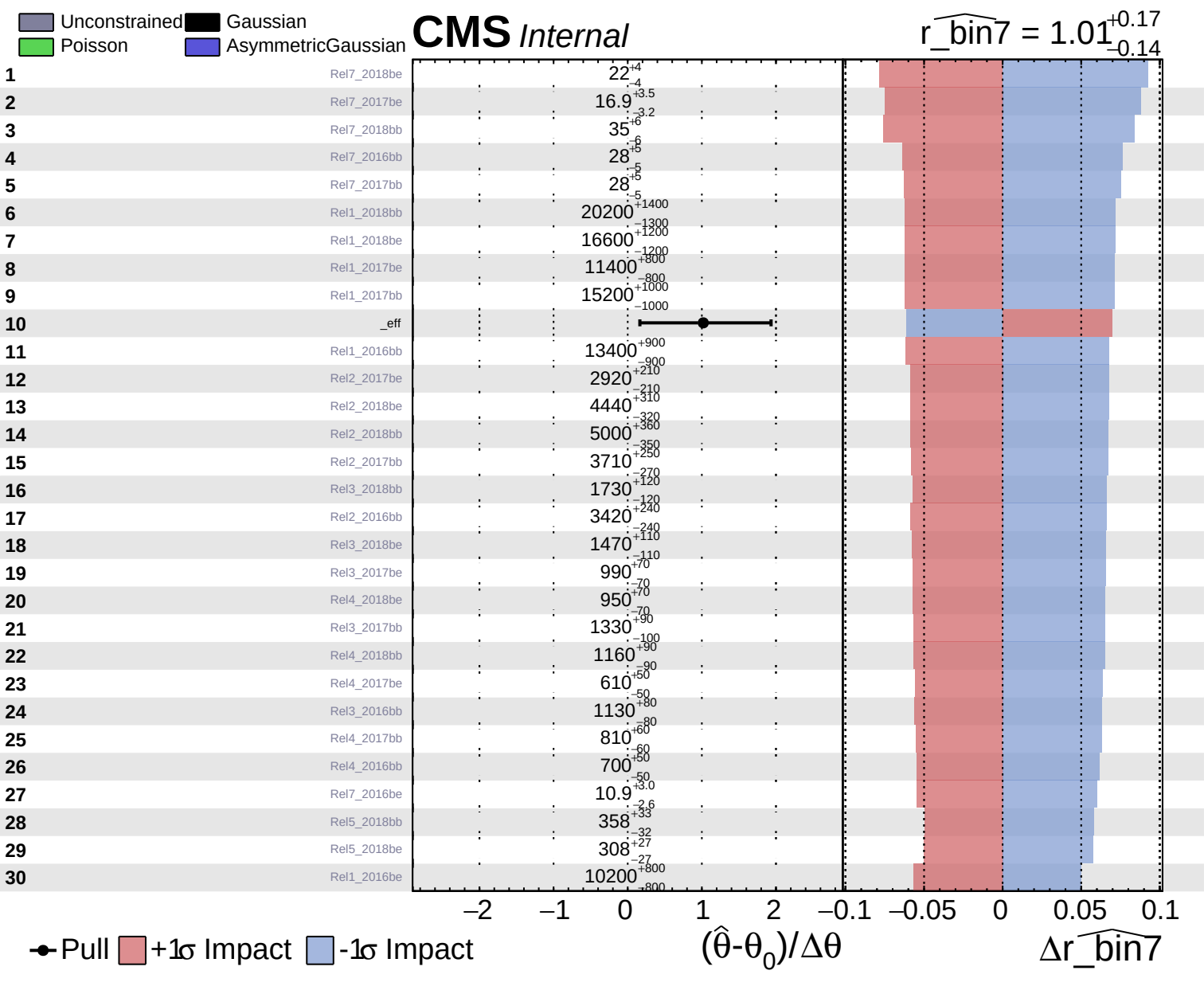
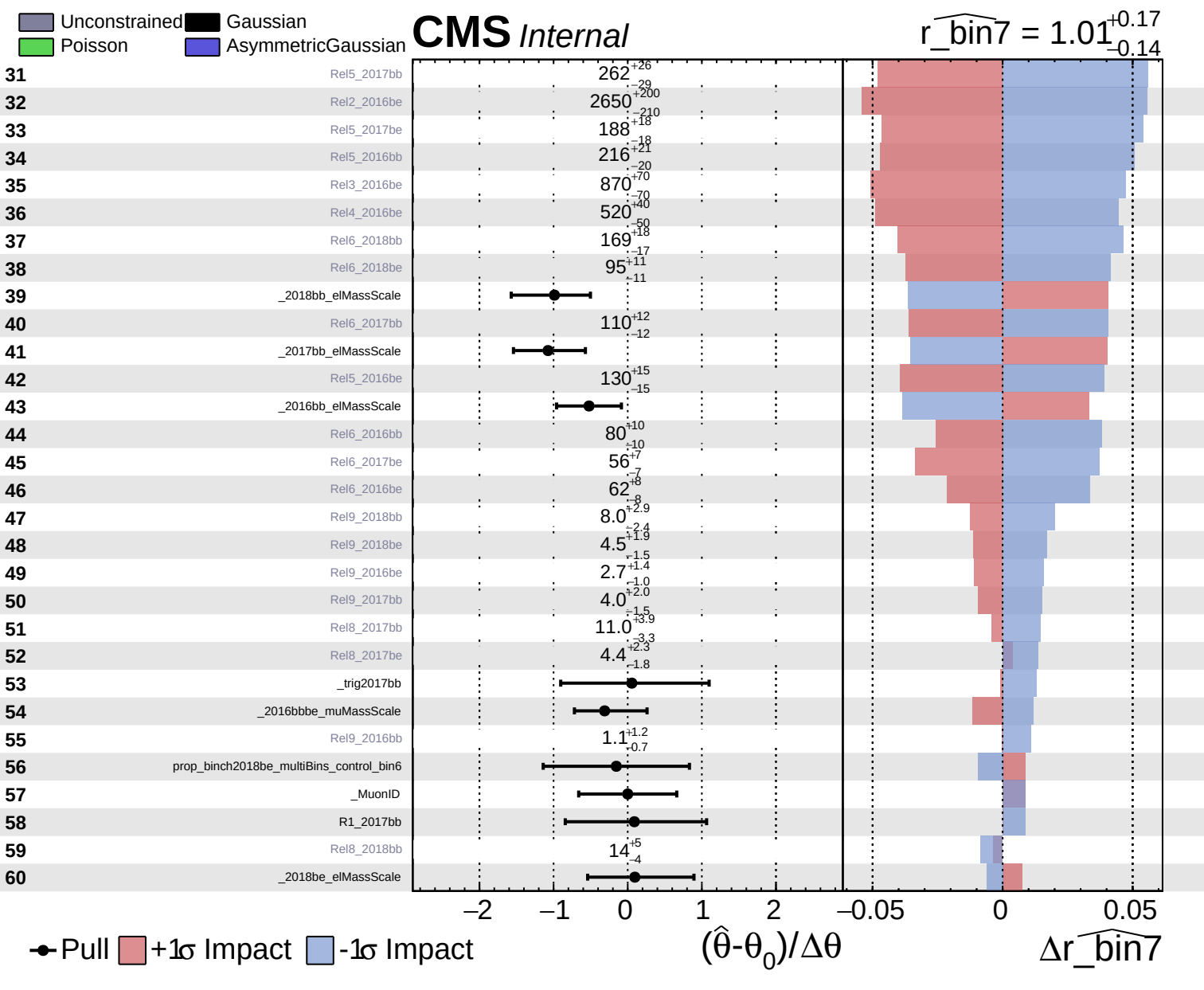

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin7 = 1.01 +0.17 −0.14
1 Rel7_2018be 22 +4 −4
2 Rel7_2017be 16.9 +3.5 −3.2
3 Rel7_2018bb 35 +6 −6
4 Rel7_2016bb 28 +5 −5
5 Rel7_2017bb 28 +5 −5
6 Rel1_2018bb 20200 +1400 −1300
7 Rel1_2018be 16600 +1200 −1200
8 Rel1_2017be 11400 +800 −800
9 Rel1_2017bb 15200 +1000 −1000
10 _eff
11 Rel1_2016bb 13400 +900 −900
12 Rel2_2017be 2920 +210 −210
13 Rel2_2018be 4440 +310 −320
14 Rel2_2018bb 5000 +360 −350
15 Rel2_2017bb 3710 +250 −270
16 Rel3_2018bb 1730 +120 −120
17 Rel2_2016bb 3420 +240 −240
18 Rel3_2018be 1470 +110 −110
19 Rel3_2017be 990 +70 −70
20 Rel4_2018be 950 +70 −70
21 Rel3_2017bb 1330 +90 −100
22 Rel4_2018bb 1160 +90 −90
23 Rel4_2017be 610 +50 −50
24 Rel3_2016bb 1130 +80 −80
25 Rel4_2017bb 810 +60 −60
26 Rel4_2016bb 700 +50 −50
27 Rel7_2016be 10.9 +3.0 −2.6
28 Rel5_2018bb 358 +33 −32
29 Rel5_2018be 308 +27 −27
30 Rel1_2016be 10200 +800 −800
−2 −1 0 1 2
−0.1 −0.05 0 0.05 0.1
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin7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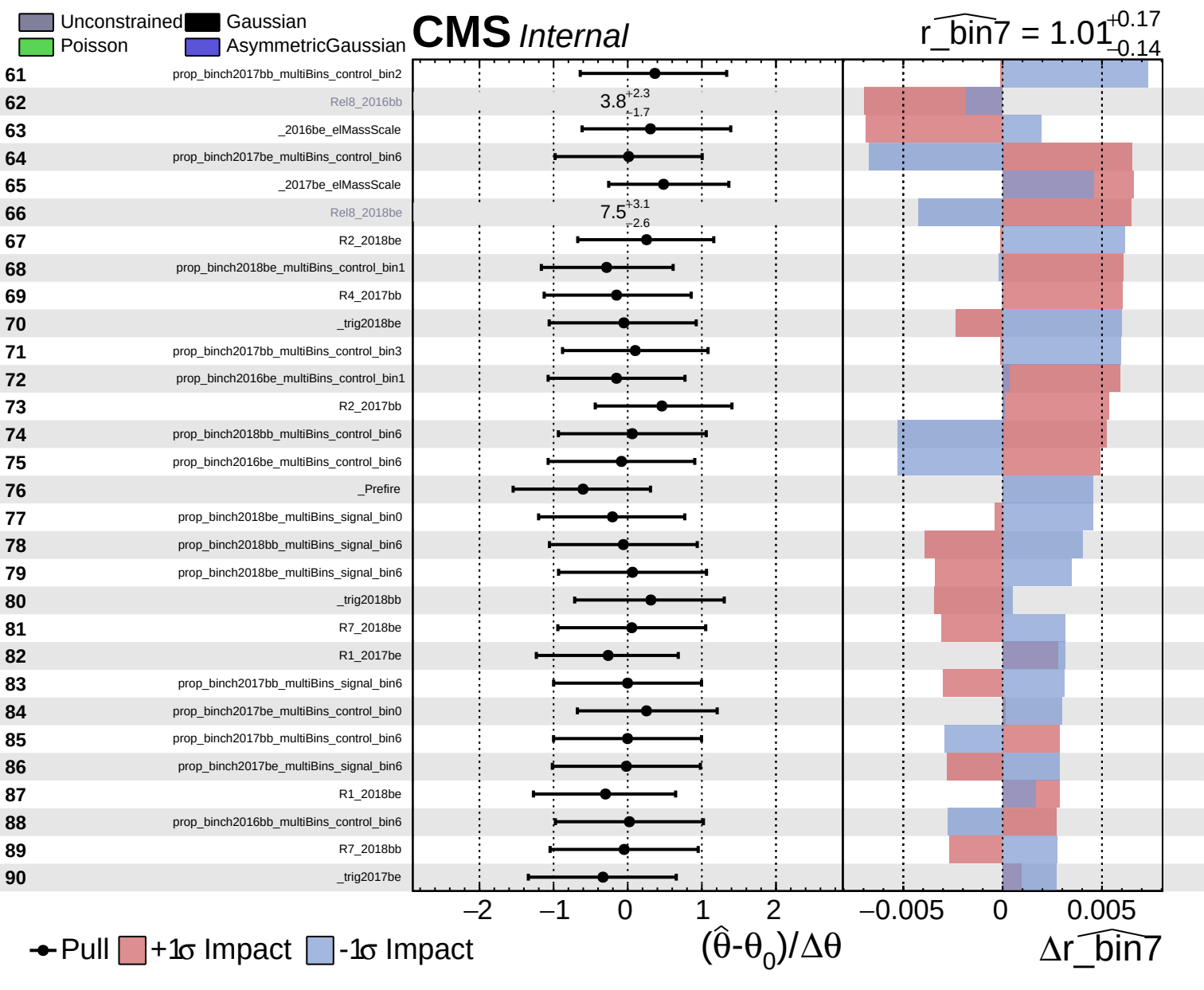
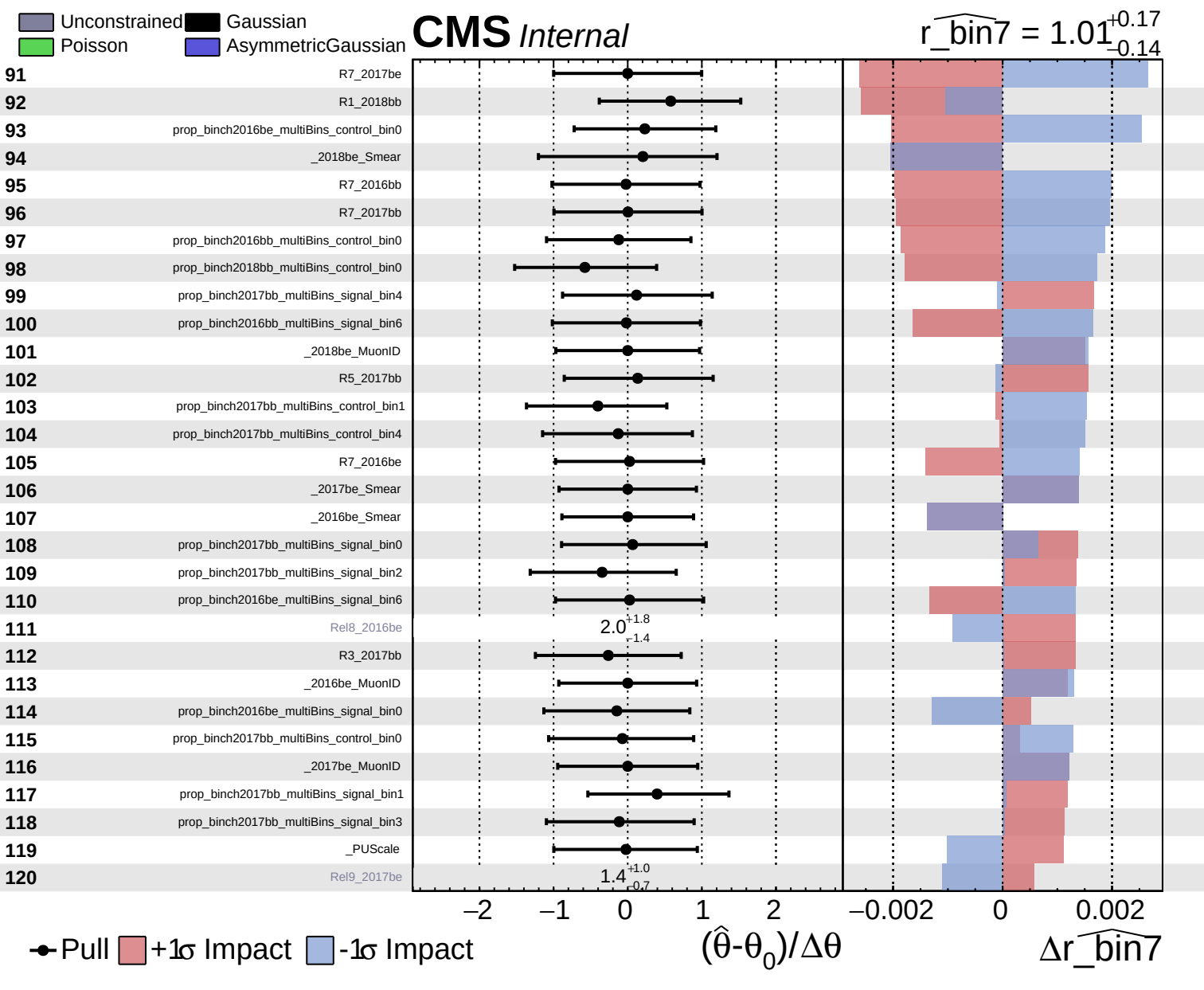
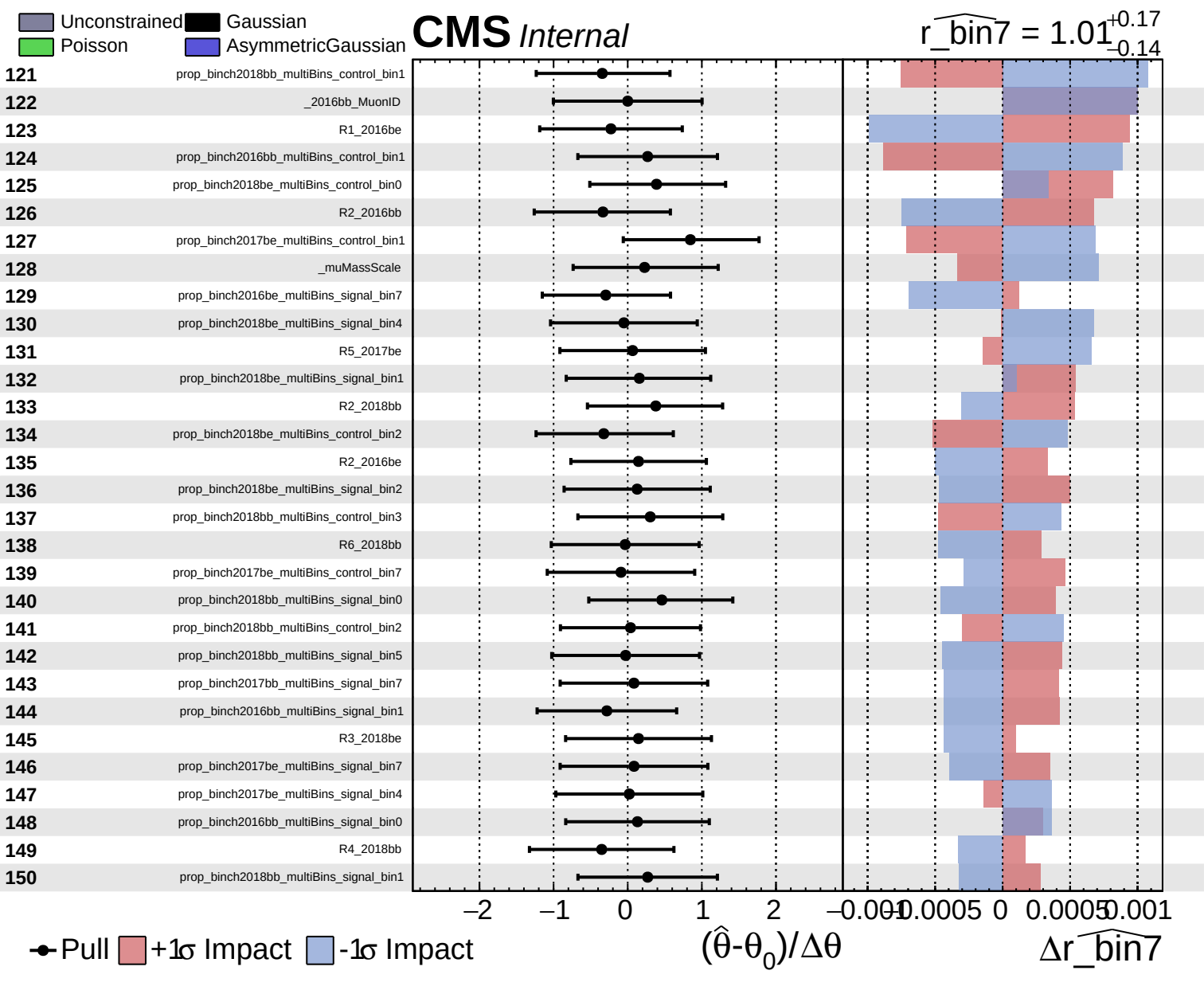
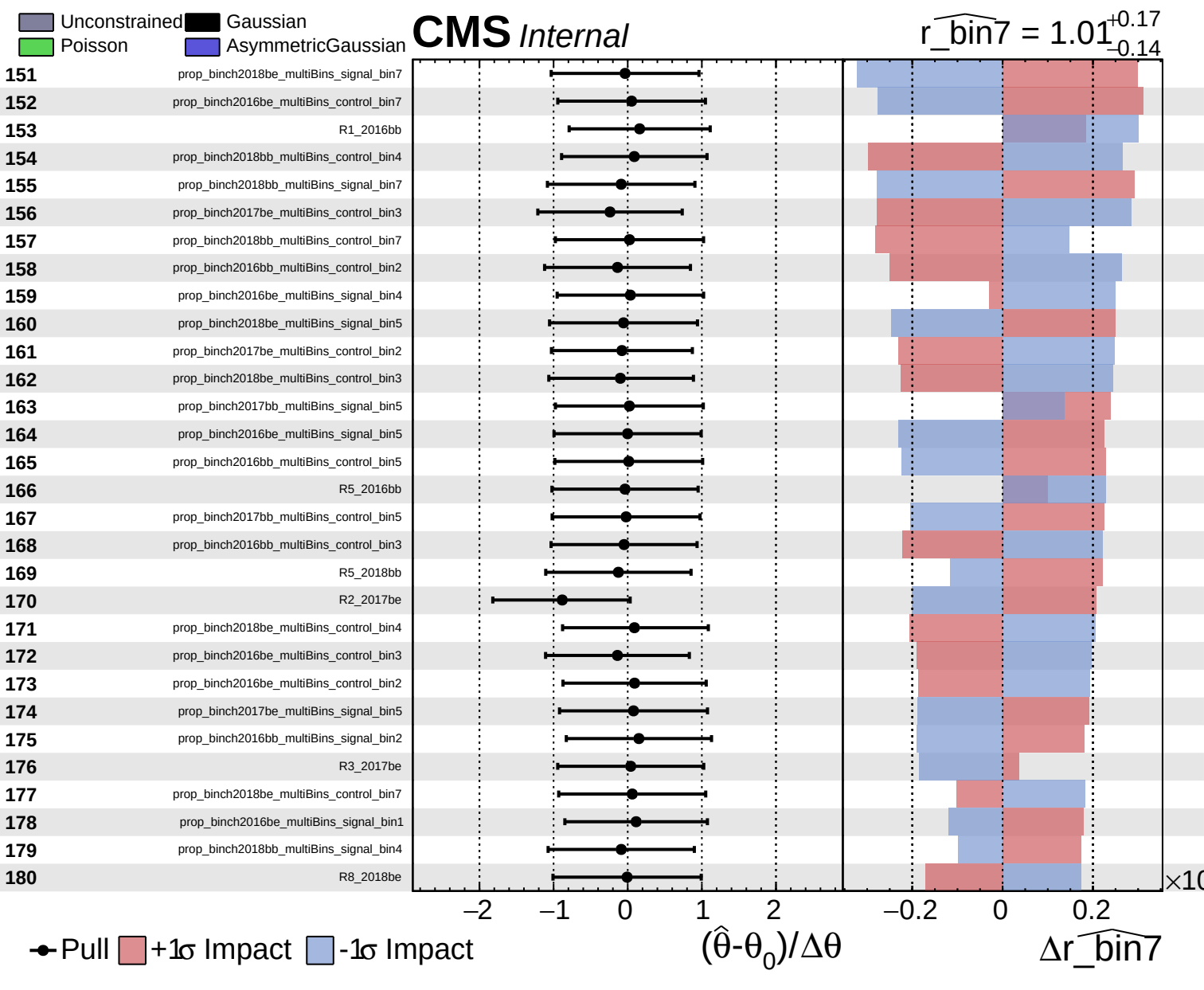
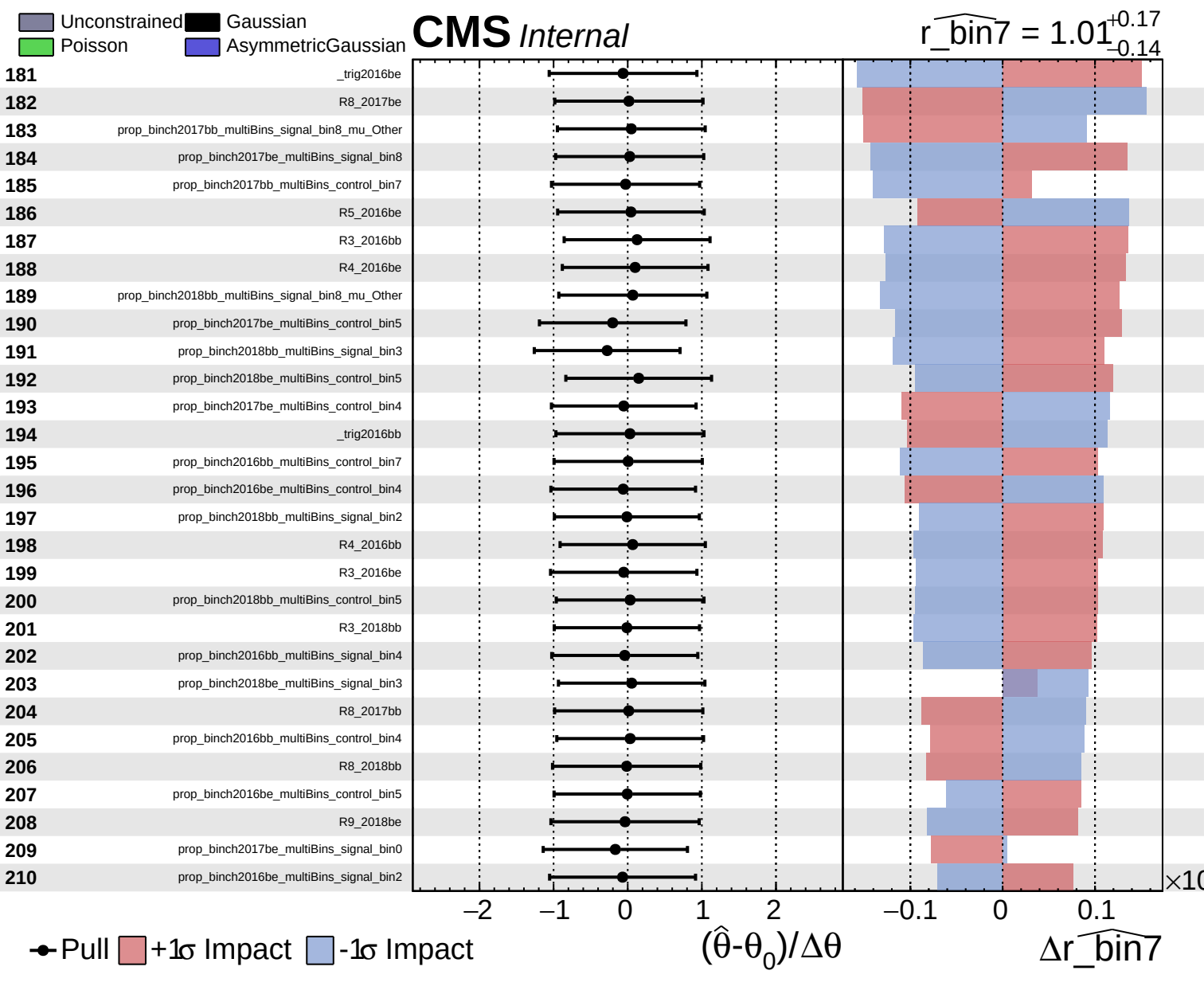
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin7 = 1.01 +0.17 −0.14
31 Rel5_2017bb 262 +26 −29
32 Rel2_2016be 2650 +200 −210
33 Rel5_2017be 188 +18 −18
34 Rel5_2016bb 216 +21 −20
35 Rel3_2016be 870 +70 −70
36 Rel4_2016be 520 +40 −50
37 Rel6_2018bb 169 +18 −17
38 Rel6_2018be 95 +11 −11
39 _2018bb_elMassScale
40 Rel6_2017bb 110 +12 −12
41 _2017bb_elMassScale
42 Rel5_2016be 130 +15 −15
43 _2016bb_elMassScale
44 Rel6_2016bb 80 +10 −10
45 Rel6_2017be 56 +7 −7
46 Rel6_2016be 62 +8 −8
47 Rel9_2018bb 8.0 +2.9 −2.4
48 Rel9_2018be 4.5 +1.9 −1.5
49 Rel9_2016be 2.7 +1.4 −1.0
50 Rel9_2017bb 4.0 +2.0 −1.5
51 Rel8_2017bb 11.0 +3.9 −3.3
52 Rel8_2017be 4.4 +2.3 −1.8
53 _trig2017bb
54 _2016bbbe_muMassScale
55 Rel9_2016bb 1.1 +1.2 −0.7
56 prop_binch2018be_multiBins_control_bin6
57 _MuonID
58 R1_2017bb
59 Rel8_2018bb 14 +5 −4
60 _2018be_elMassScale
−2 −1 0 1 2
−0.05 0 0.05
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr_bin7

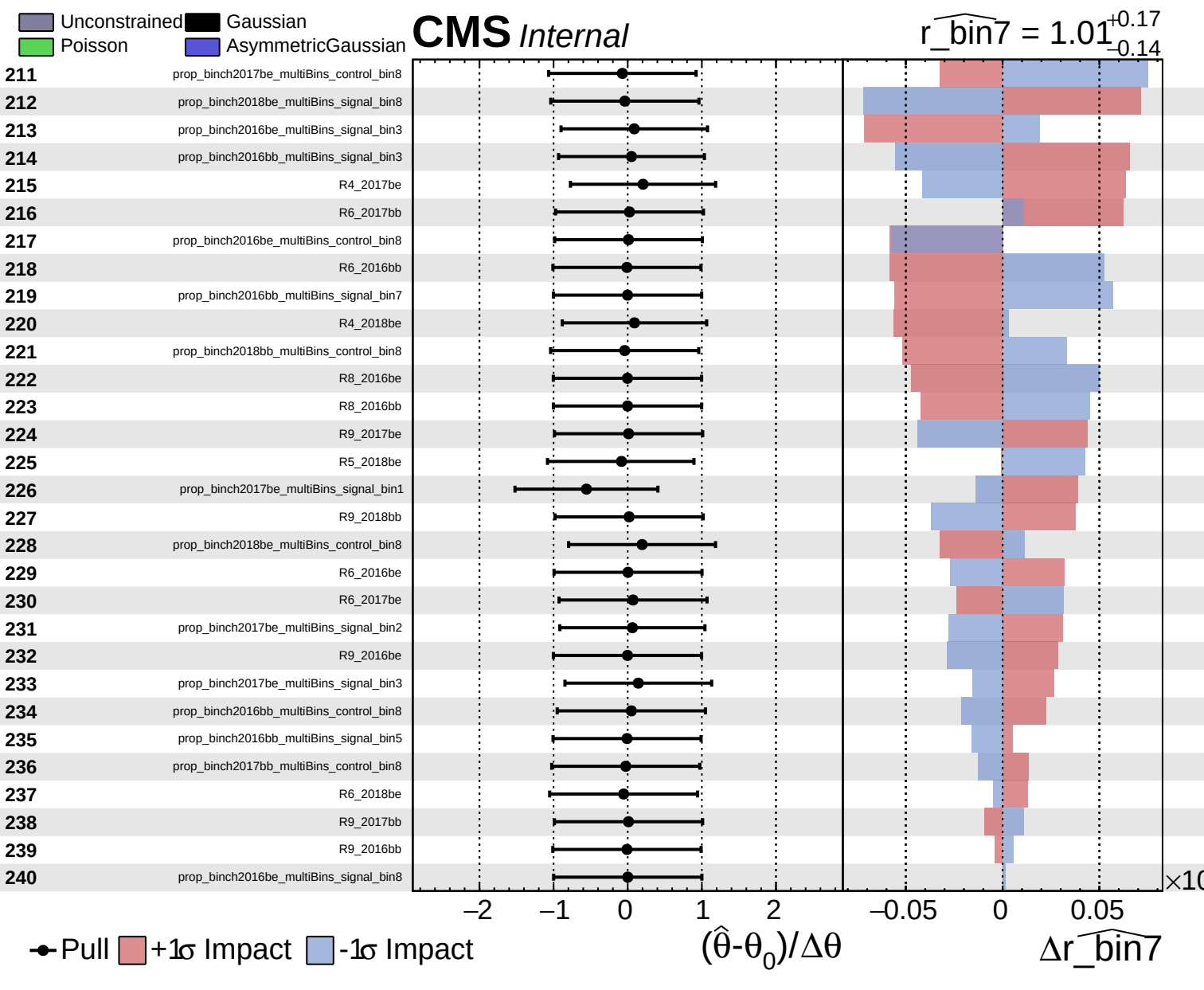

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin7 = 1.01 +0.17 −0.14
61 prop_binch2017bb_multiBins_control_bin2
62 Rel8_2016bb
3.8 +2.3 −1.7
63 _2016be_elMassScale
64 prop_binch2017be_multiBins_control_bin6
65 _2017be_elMassScale
66 Rel8_2018be
7.5 +3.1 −2.6
67 R2_2018be
68 prop_binch2018be_multiBins_control_bin1
69 R4_2017bb
70 _trig2018be
71 prop_binch2017bb_multiBins_control_bin3
72 prop_binch2016be_multiBins_control_bin1
73 R2_2017bb
74 prop_binch2018bb_multiBins_control_bin6
75 prop_binch2016be_multiBins_control_bin6
76 _Prefire
77 prop_binch2018be_multiBins_signal_bin0
78 prop_binch2018bb_multiBins_signal_bin6
79 prop_binch2018be_multiBins_signal_bin6
80 _trig2018bb
81 R7_2018be
82 R1_2017be
83 prop_binch2017bb_multiBins_signal_bin6
84 prop_binch2017be_multiBins_control_bin0
85 prop_binch2017bb_multiBins_control_bin6
86 prop_binch2017be_multiBins_signal_bin6
87 R1_2018be
88 prop_binch2016bb_multiBins_control_bin6
89 R7_2018bb
90 _trig2017be
−2 −1 0 1 2
(θ̂-θ0)/Δθ
−0.005 0 0.005
Δr_bin7
Pull
+1σ Impact
-1σ Impact

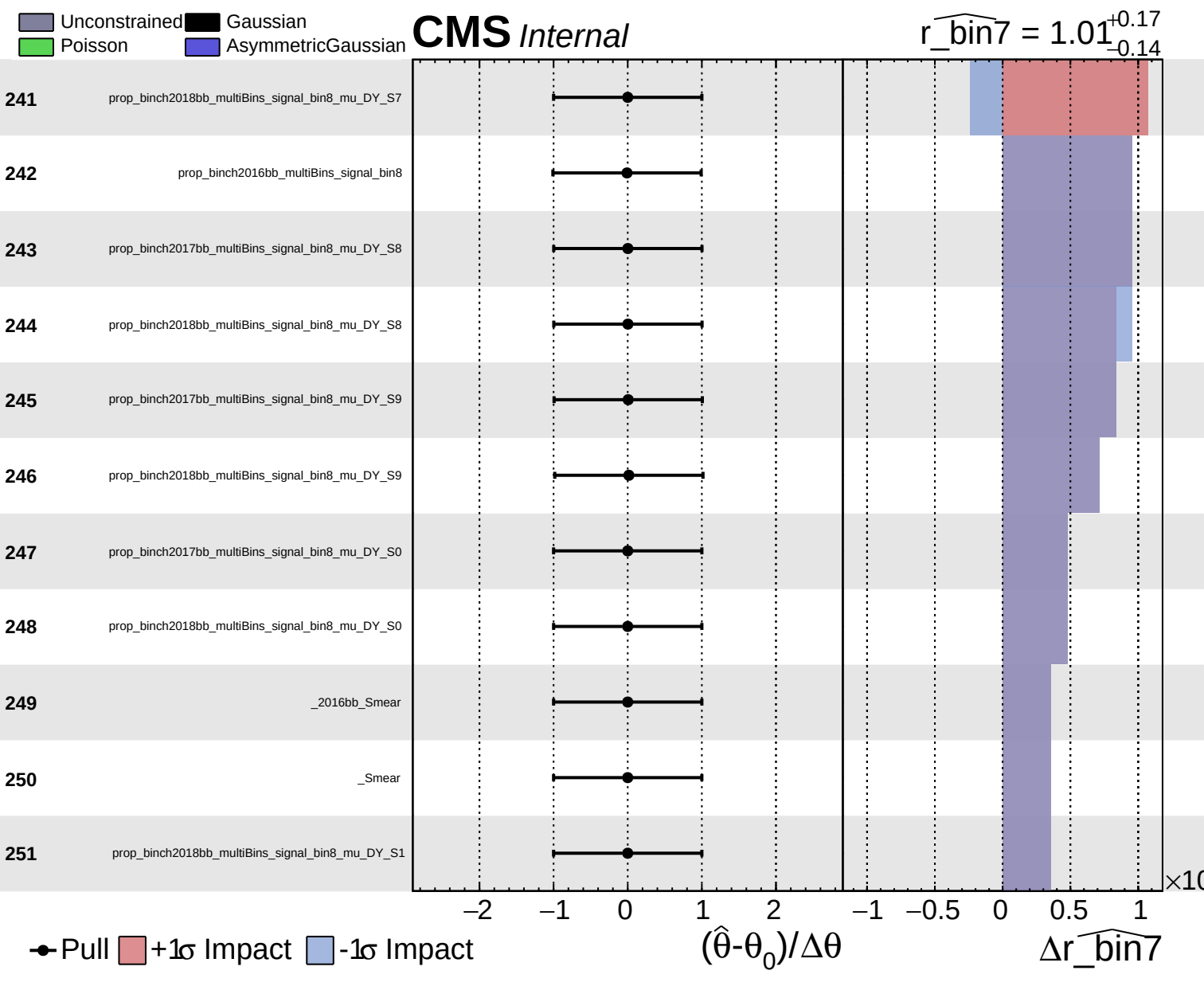

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin7 = 1.01 +0.17 −0.14
91 R7_2017be
92 R1_2018bb
93 prop_binch2016be_multiBins_control_bin0
94 _2018be_Smear
95 R7_2016bb
96 R7_2017bb
97 prop_binch2016bb_multiBins_control_bin0
98 prop_binch2018bb_multiBins_control_bin0
99 prop_binch2017bb_multiBins_signal_bin4
100 prop_binch2016bb_multiBins_signal_bin6
101 _2018be_MuonID
102 R5_2017bb
103 prop_binch2017bb_multiBins_control_bin1
104 prop_binch2017bb_multiBins_control_bin4
105 R7_2016be
106 _2017be_Smear
107 _2016be_Smear
108 prop_binch2017bb_multiBins_signal_bin0
109 prop_binch2017bb_multiBins_signal_bin2
110 prop_binch2016be_multiBins_signal_bin6
111 Rel8_2016be
2.0 +1.8 −1.4
112 R3_2017bb
113 _2016be_MuonID
114 prop_binch2016be_multiBins_signal_bin0
115 prop_binch2017bb_multiBins_control_bin0
116 _2017be_MuonID
117 prop_binch2017bb_multiBins_signal_bin1
118 prop_binch2017bb_multiBins_signal_bin3
119 _PUScale
120 Rel9_2017be
1.4 +1.0 −0.7
−2 −1 0 1 2
−0.002 0 0.002
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin7


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin7 = 1.01 +0.17 −0.14
121 prop_binch2018bb_multiBins_control_bin1
122 _2016bb_MuonID
123 R1_2016be
124 prop_binch2016bb_multiBins_control_bin1
125 prop_binch2018be_multiBins_control_bin0
126 R2_2016bb
127 prop_binch2017be_multiBins_control_bin1
128 _muMassScale
129 prop_binch2016be_multiBins_signal_bin7
130 prop_binch2018be_multiBins_signal_bin4
131 R5_2017be
132 prop_binch2018be_multiBins_signal_bin1
133 R2_2018bb
134 prop_binch2018be_multiBins_control_bin2
135 R2_2016be
136 prop_binch2018be_multiBins_signal_bin2
137 prop_binch2018bb_multiBins_control_bin3
138 R6_2018bb
139 prop_binch2017be_multiBins_control_bin7
140 prop_binch2018bb_multiBins_signal_bin0
141 prop_binch2018bb_multiBins_control_bin2
142 prop_binch2018bb_multiBins_signal_bin5
143 prop_binch2017bb_multiBins_signal_bin7
144 prop_binch2016bb_multiBins_signal_bin1
145 R3_2018be
146 prop_binch2017be_multiBins_signal_bin7
147 prop_binch2017be_multiBins_signal_bin4
148 prop_binch2016bb_multiBins_signal_bin0
149 R4_2018bb
150 prop_binch2018bb_multiBins_signal_bin1
−2
−1
0
1
2
−0.001
−0.0005
0
0.0005
0.001
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin7


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin7 = 1.01 +0.17 −0.14
151 prop_binch2018be_multiBins_signal_bin7
152 prop_binch2016be_multiBins_control_bin7
153 R1_2016bb
154 prop_binch2018bb_multiBins_control_bin4
155 prop_binch2018bb_multiBins_signal_bin7
156 prop_binch2017be_multiBins_control_bin3
157 prop_binch2018bb_multiBins_control_bin7
158 prop_binch2016bb_multiBins_control_bin2
159 prop_binch2016be_multiBins_signal_bin4
160 prop_binch2018be_multiBins_signal_bin5
161 prop_binch2017be_multiBins_control_bin2
162 prop_binch2018be_multiBins_control_bin3
163 prop_binch2017bb_multiBins_signal_bin5
164 prop_binch2016be_multiBins_signal_bin5
165 prop_binch2016bb_multiBins_control_bin5
166 R5_2016bb
167 prop_binch2017bb_multiBins_control_bin5
168 prop_binch2016bb_multiBins_control_bin3
169 R5_2018bb
170 R2_2017be
171 prop_binch2018be_multiBins_control_bin4
172 prop_binch2016be_multiBins_control_bin3
173 prop_binch2016be_multiBins_control_bin2
174 prop_binch2017be_multiBins_signal_bin5
175 prop_binch2016bb_multiBins_signal_bin2
176 R3_2017be
177 prop_binch2018be_multiBins_control_bin7
178 prop_binch2016be_multiBins_signal_bin1
179 prop_binch2018bb_multiBins_signal_bin4
180 R8_2018be
−2 −1 0 1 2
−0.2 0 0.2
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin7


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin7 = 1.01 +0.17 −0.14
181 _trig2016be
182 R8_2017be
183 prop_binch2017bb_multiBins_signal_bin8_mu_Other
184 prop_binch2017be_multiBins_signal_bin8
185 prop_binch2017bb_multiBins_control_bin7
186 R5_2016be
187 R3_2016bb
188 R4_2016be
189 prop_binch2018bb_multiBins_signal_bin8_mu_Other
190 prop_binch2017be_multiBins_control_bin5
191 prop_binch2018bb_multiBins_signal_bin3
192 prop_binch2018be_multiBins_control_bin5
193 prop_binch2017be_multiBins_control_bin4
194 _trig2016bb
195 prop_binch2016bb_multiBins_control_bin7
196 prop_binch2016be_multiBins_control_bin4
197 prop_binch2018bb_multiBins_signal_bin2
198 R4_2016bb
199 R3_2016be
200 prop_binch2018bb_multiBins_control_bin5
201 R3_2018bb
202 prop_binch2016bb_multiBins_signal_bin4
203 prop_binch2018be_multiBins_signal_bin3
204 R8_2017bb
205 prop_binch2016bb_multiBins_control_bin4
206 R8_2018bb
207 prop_binch2016be_multiBins_control_bin5
208 R9_2018be
209 prop_binch2017be_multiBins_signal_bin0
210 prop_binch2016be_multiBins_signal_bin2
−2
−1
0
1
2
−0.1
0
0.1
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin7


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin7 = 1.01 +0.17 −0.14
211 prop_binch2017be_multiBins_control_bin8
212 prop_binch2018be_multiBins_signal_bin8
213 prop_binch2016be_multiBins_signal_bin3
214 prop_binch2016bb_multiBins_signal_bin3
215 R4_2017be
216 R6_2017bb
217 prop_binch2016be_multiBins_control_bin8
218 R6_2016bb
219 prop_binch2016bb_multiBins_signal_bin7
220 R4_2018be
221 prop_binch2018bb_multiBins_control_bin8
222 R8_2016be
223 R8_2016bb
224 R9_2017be
225 R5_2018be
226 prop_binch2017be_multiBins_signal_bin1
227 R9_2018bb
228 prop_binch2018be_multiBins_control_bin8
229 R6_2016be
230 R6_2017be
231 prop_binch2017be_multiBins_signal_bin2
232 R9_2016be
233 prop_binch2017be_multiBins_signal_bin3
234 prop_binch2016bb_multiBins_control_bin8
235 prop_binch2016bb_multiBins_signal_bin5
236 prop_binch2017bb_multiBins_control_bin8
237 R6_2018be
238 R9_2017bb
239 R9_2016bb
240 prop_binch2016be_multiBins_signal_bin8
×10
−2 −1 0 1 2
−0.05 0 0.05
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin7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Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin7 = 1.01 +0.17 −0.14
241 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S7
242 prop_binch2016bb_multiBins_signal_bin8
243 prop_binch2017bb_multiBins_signal_bin8_mu_DY_S8
244 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S8
245 prop_binch2017bb_multiBins_signal_bin8_mu_DY_S9
246 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S9
247 prop_binch2017bb_multiBins_signal_bin8_mu_DY_S0
248 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S0
249 _2016bb_Smear
250 _Smear
251 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S1
−2 −1 0 1 2
−1 −0.5 0 0.5 1
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin7