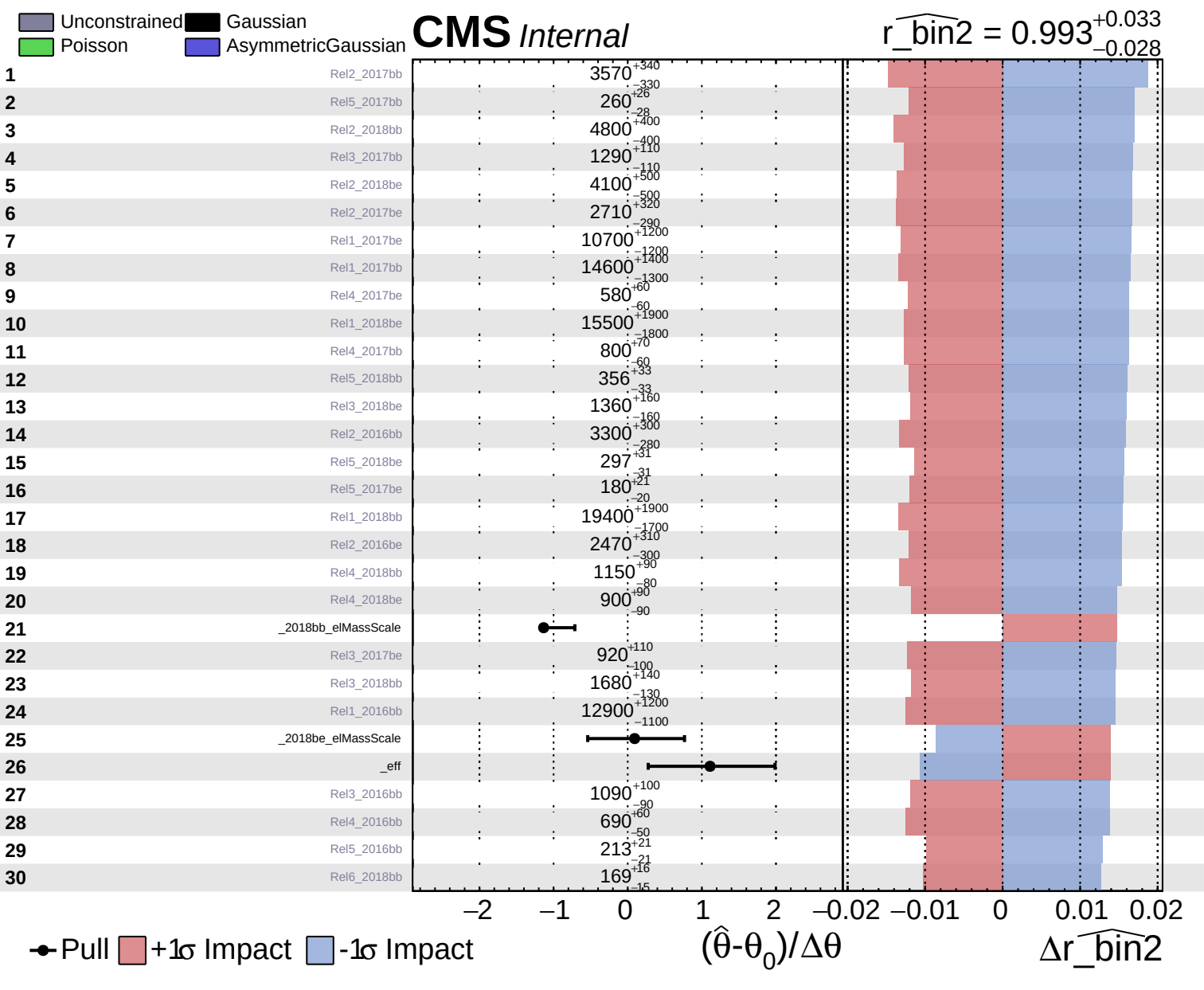
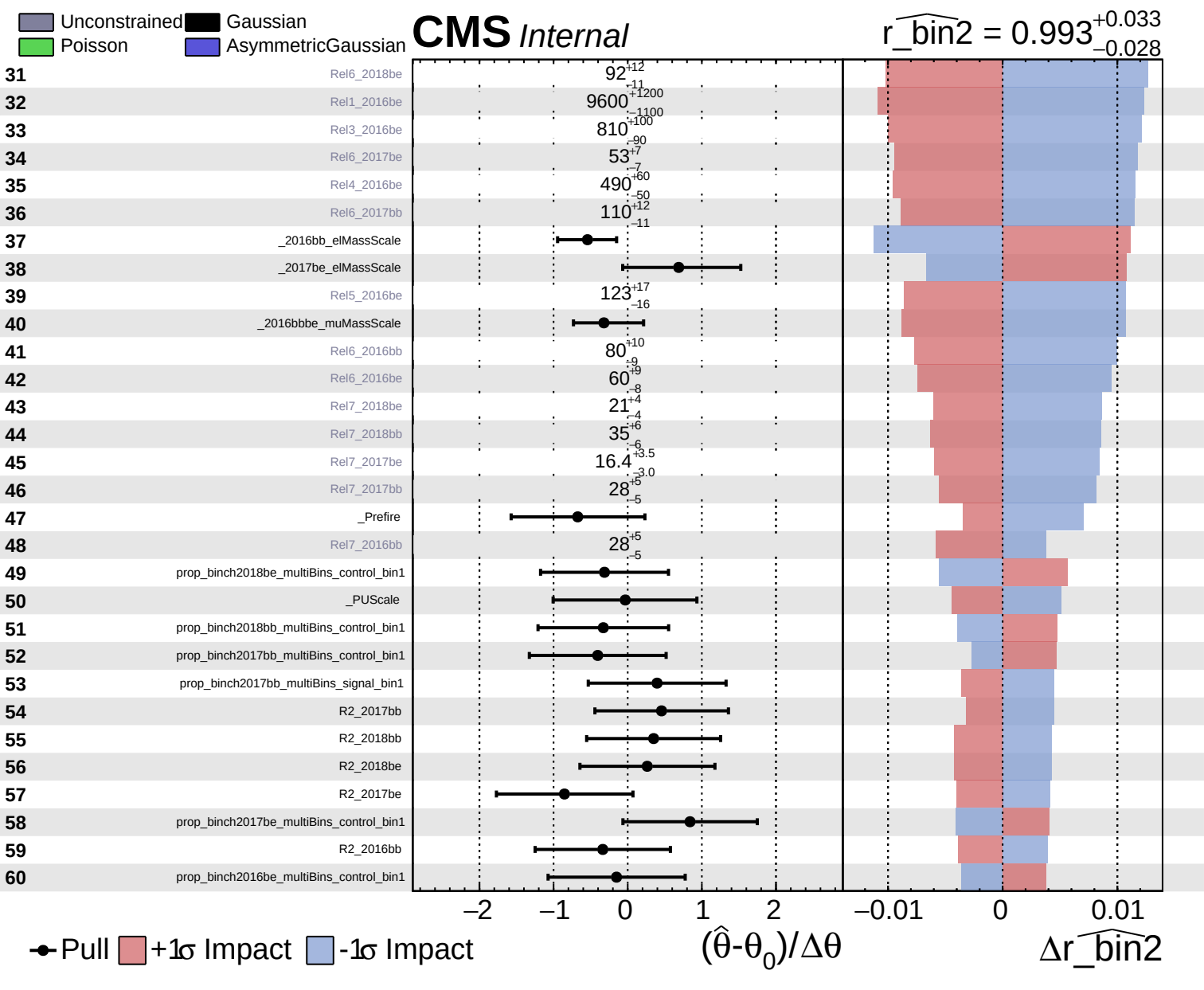
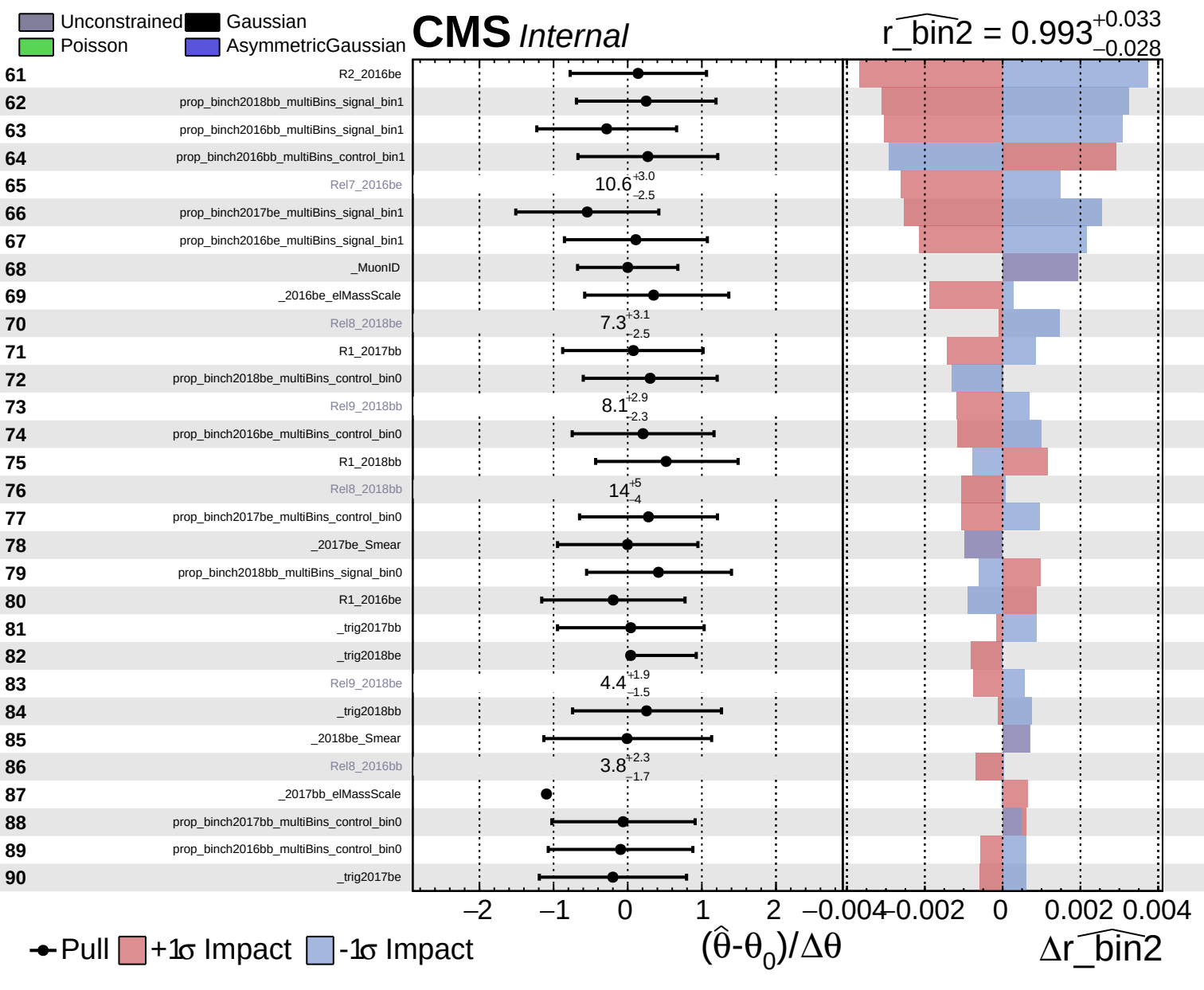

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin2 = 0.993 +0.033 −0.028
1 Rel2_2017bb 3570 +340 −330
2 Rel5_2017bb 260 +26 −28
3 Rel2_2018bb 4800 +400 −400
4 Rel3_2017bb 1290 +110 −110
5 Rel2_2018be 4100 +500 −500
6 Rel2_2017be 2710 +320 −290
7 Rel1_2017be 10700 +1200 −1200
8 Rel1_2017bb 14600 +1400 −1300
9 Rel4_2017be 580 +60 −60
10 Rel1_2018be 15500 +1900 −1800
11 Rel4_2017bb 800 +70 −60
12 Rel5_2018bb 356 +33 −33
13 Rel3_2018be 1360 +160 −160
14 Rel2_2016bb 3300 +300 −280
15 Rel5_2018be 297 +31 −31
16 Rel5_2017be 180 +21 −20
17 Rel1_2018bb 19400 +1900 −1700
18 Rel2_2016be 2470 +310 −300
19 Rel4_2018bb 1150 +90 −80
20 Rel4_2018be 900 +90 −90
21 _2018bb_elMassScale
22 Rel3_2017be 920 +110 −100
23 Rel3_2018bb 1680 +140 −130
24 Rel1_2016bb 12900 +1200 −1100
25 _2018be_elMassScale
26 _eff
27 Rel3_2016bb 1090 +100 −90
28 Rel4_2016bb 690 +60 −50
29 Rel5_2016bb 213 +21 −21
30 Rel6_2018bb 169 +16 −15
−2 −1 0 1 2
−0.02 −0.01 0 0.01 0.02
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin2


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin2 = 0.993 +0.033 −0.028
31 Rel6_2018be 92 +12 −11
32 Rel1_2016be 9600 +1200 −1100
33 Rel3_2016be 810 +100 −90
34 Rel6_2017be 53 +7 −7
35 Rel4_2016be 490 +60 −50
36 Rel6_2017bb 110 +12 −11
37 _2016bb_elMassScale
38 _2017be_elMassScale
39 Rel5_2016be 123 +17 −16
40 _2016bbbe_muMassScale
41 Rel6_2016bb 80 +10 −9
42 Rel6_2016be 60 +9 −8
43 Rel7_2018be 21 +4 −4
44 Rel7_2018bb 35 +6 −6
45 Rel7_2017be 16.4 +3.5 −3.0
46 Rel7_2017bb 28 +5 −5
47 _Prefire
48 Rel7_2016bb 28 +5 −5
49 prop_binch2018be_multiBins_control_bin1
50 _PUScale
51 prop_binch2018bb_multiBins_control_bin1
52 prop_binch2017bb_multiBins_control_bin1
53 prop_binch2017bb_multiBins_signal_bin1
54 R2_2017bb
55 R2_2018bb
56 R2_2018be
57 R2_2017be
58 prop_binch2017be_multiBins_control_bin1
59 R2_2016bb
60 prop_binch2016be_multiBins_control_bin1
−2 −1 0 1 2
−0.01 0 0.01
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr_bin2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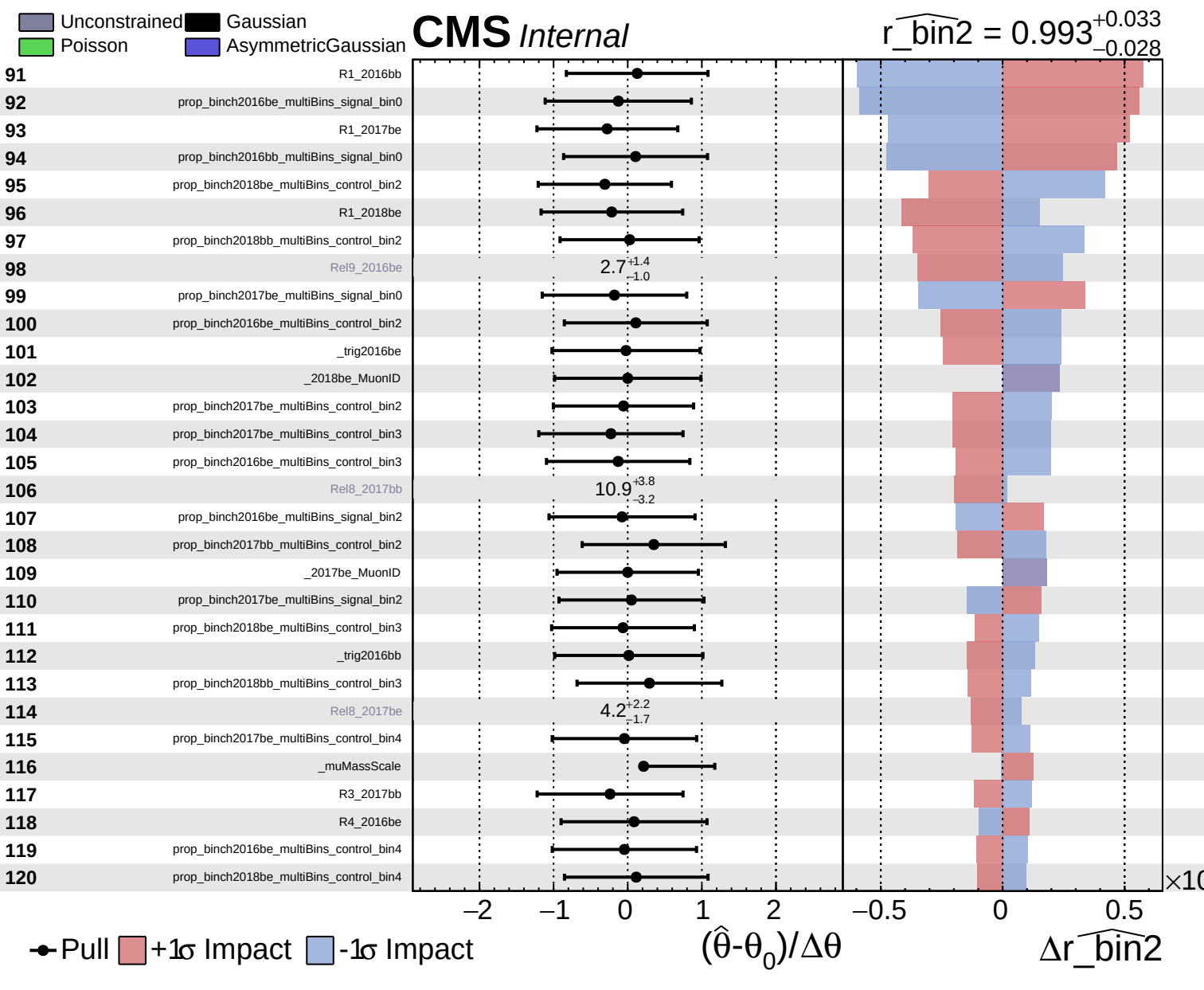
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin2 = 0.993 +0.033 −0.028
61 R2_2016be
62 prop_binch2018bb_multiBins_signal_bin1
63 prop_binch2016bb_multiBins_signal_bin1
64 prop_binch2016bb_multiBins_control_bin1
65 Rel7_2016be
66 prop_binch2017be_multiBins_signal_bin1
67 prop_binch2016be_multiBins_signal_bin1
68 _MuonID
69 _2016be_elMassScale
70 Rel8_2018be
71 R1_2017bb
72 prop_binch2018be_multiBins_control_bin0
73 Rel9_2018bb
74 prop_binch2016be_multiBins_control_bin0
75 R1_2018bb
76 Rel8_2018bb
77 prop_binch2017be_multiBins_control_bin0
78 _2017be_Smear
79 prop_binch2018bb_multiBins_signal_bin0
80 R1_2016be
81 _trig2017bb
82 _trig2018be
83 Rel9_2018be
84 _trig2018bb
85 _2018be_Smear
86 Rel8_2016bb
87 _2017bb_elMassScale
88 prop_binch2017bb_multiBins_control_bin0
89 prop_binch2016bb_multiBins_control_bin0
90 _trig2017be
10.6 +3.0 −2.5
7.3 +3.1 −2.5
8.1 +2.9 −2.3
14 +5 −4
4.4 +1.9 −1.5
3.8 +2.3 −1.7
−2 −1 0 1 2
−0.004 −0.002 0 0.002 0.004
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin2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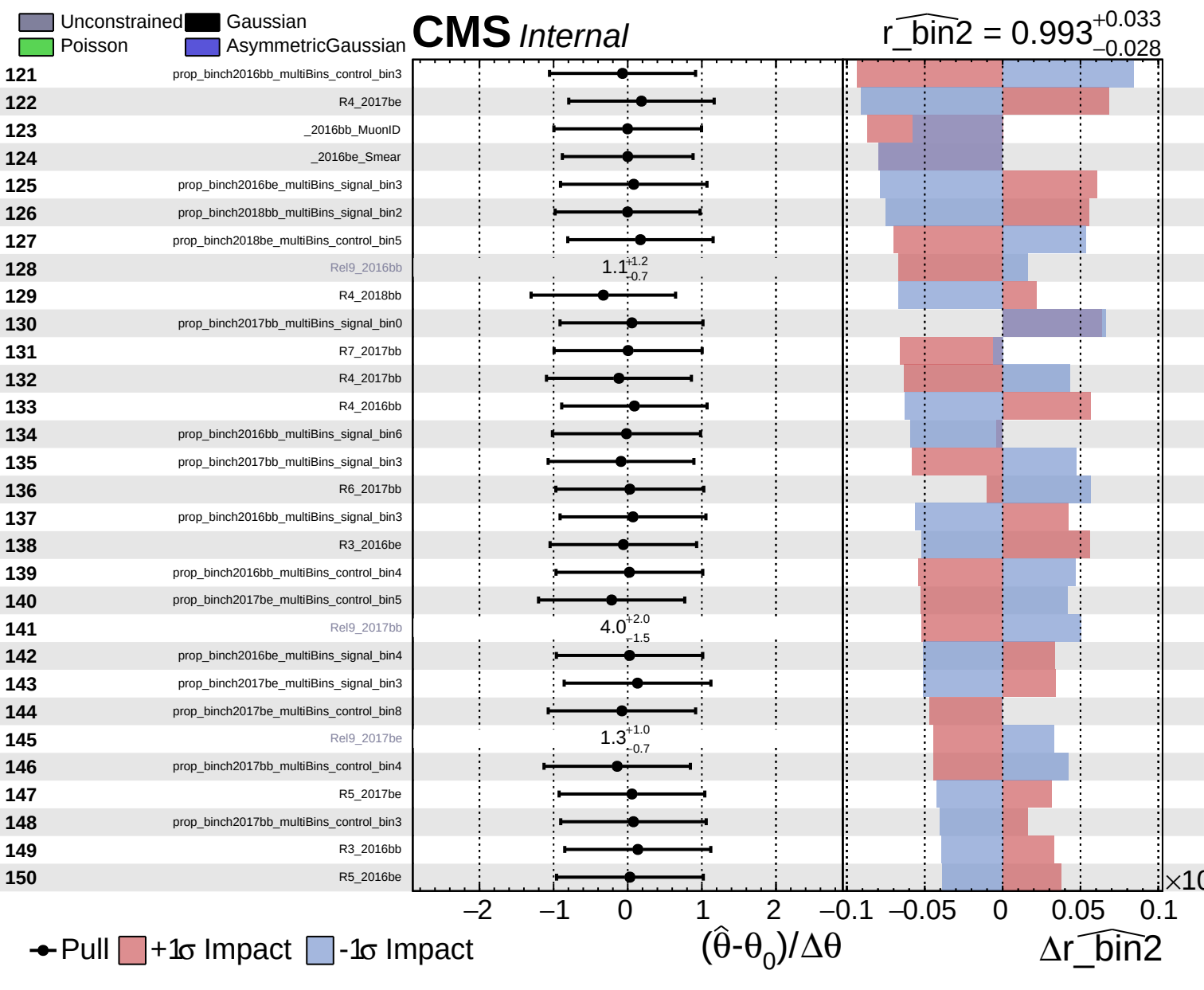
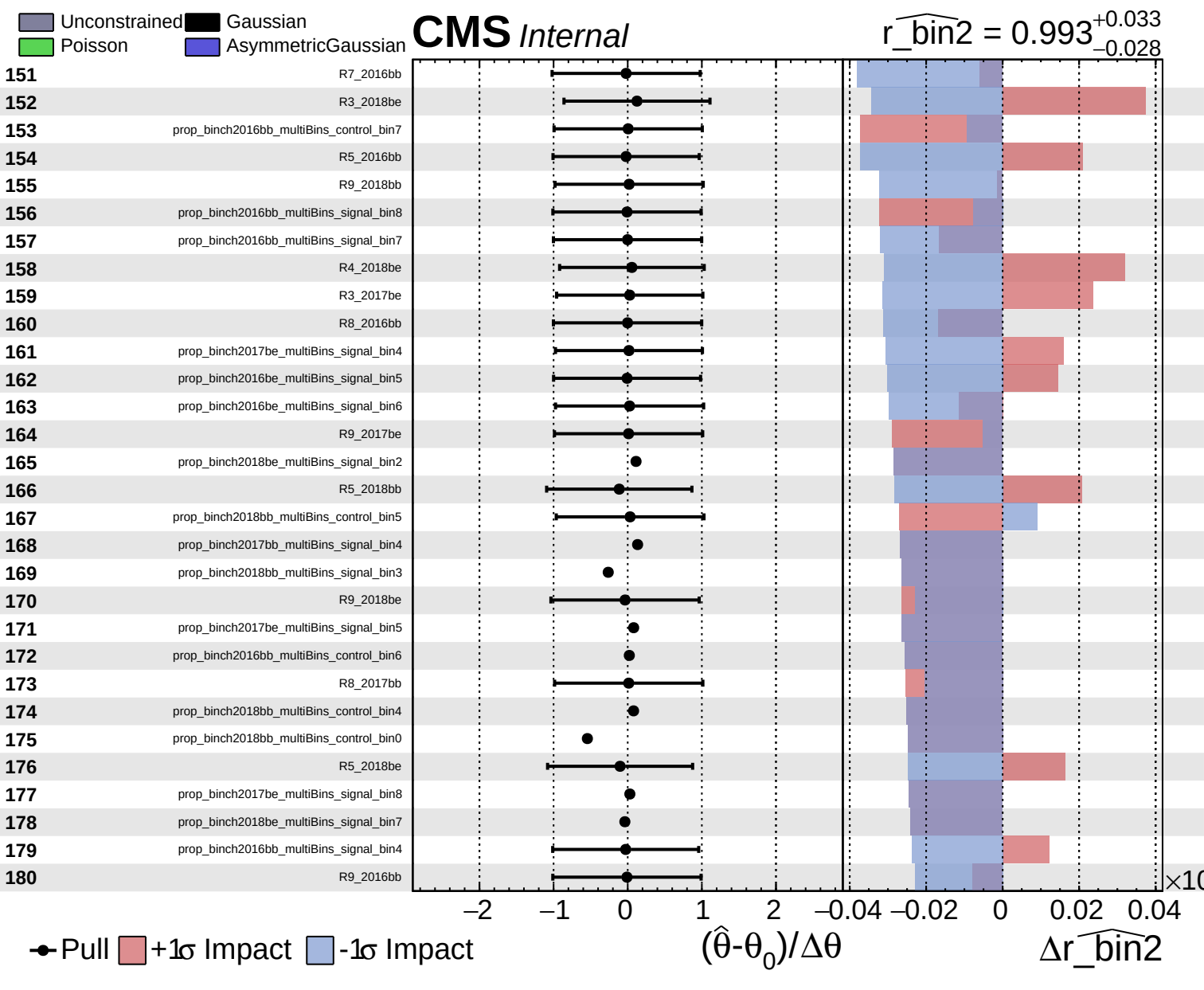
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin2 = 0.993 +0.033 −0.028
91 R1_2016bb
92 prop_binch2016be_multiBins_signal_bin0
93 R1_2017be
94 prop_binch2016bb_multiBins_signal_bin0
95 prop_binch2018be_multiBins_control_bin2
96 R1_2018be
97 prop_binch2018bb_multiBins_control_bin2
98 Rel9_2016be
2.7 +1.4 −1.0
99 prop_binch2017be_multiBins_signal_bin0
100 prop_binch2016be_multiBins_control_bin2
101 _trig2016be
102 _2018be_MuonID
103 prop_binch2017be_multiBins_control_bin2
104 prop_binch2017be_multiBins_control_bin3
105 prop_binch2016be_multiBins_control_bin3
106 Rel8_2017bb
10.9 +3.8 −3.2
107 prop_binch2016be_multiBins_signal_bin2
108 prop_binch2017bb_multiBins_control_bin2
109 _2017be_MuonID
110 prop_binch2017be_multiBins_signal_bin2
111 prop_binch2018be_multiBins_control_bin3
112 _trig2016bb
113 prop_binch2018bb_multiBins_control_bin3
114 Rel8_2017be
4.2 +2.2 −1.7
115 prop_binch2017be_multiBins_control_bin4
116 _muMassScale
117 R3_2017bb
118 R4_2016be
119 prop_binch2016be_multiBins_control_bin4
120 prop_binch2018be_multiBins_control_bin4
−2 −1 0 1 2
−0.5 0 0.5
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin2


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin2 = 0.993 +0.033 −0.028
121 prop_binch2016bb_multiBins_control_bin3
122 R4_2017be
123 _2016bb_MuonID
124 _2016be_Smear
125 prop_binch2016be_multiBins_signal_bin3
126 prop_binch2018bb_multiBins_signal_bin2
127 prop_binch2018be_multiBins_control_bin5
128 Rel9_2016bb
1.1 +1.2 -0.7
129 R4_2018bb
130 prop_binch2017bb_multiBins_signal_bin0
131 R7_2017bb
132 R4_2017bb
133 R4_2016bb
134 prop_binch2016bb_multiBins_signal_bin6
135 prop_binch2017bb_multiBins_signal_bin3
136 R6_2017bb
137 prop_binch2016bb_multiBins_signal_bin3
138 R3_2016be
139 prop_binch2016bb_multiBins_control_bin4
140 prop_binch2017be_multiBins_control_bin5
141 Rel9_2017bb
4.0 +2.0 -1.5
142 prop_binch2016be_multiBins_signal_bin4
143 prop_binch2017be_multiBins_signal_bin3
144 prop_binch2017be_multiBins_control_bin8
145 Rel9_2017be
1.3 +1.0 -0.7
146 prop_binch2017bb_multiBins_control_bin4
147 R5_2017be
148 prop_binch2017bb_multiBins_control_bin3
149 R3_2016bb
150 R5_2016be
−2 −1 0 1 2
−0.1 −0.05 0 0.05 0.1
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin2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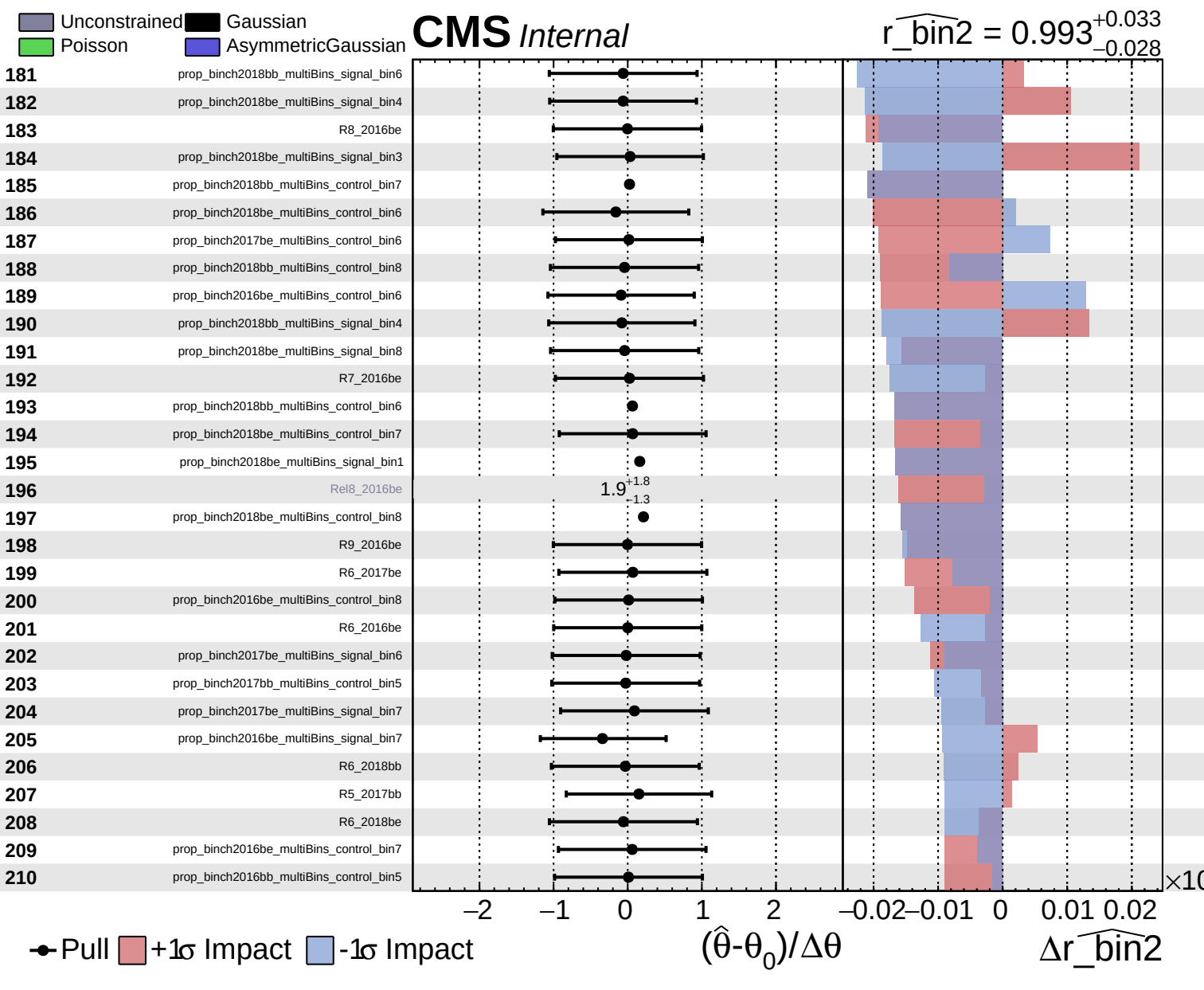
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin2 = 0.993 +0.033 −0.028
151 R7_2016bb
152 R3_2018be
153 prop_binch2016bb_multiBins_control_bin7
154 R5_2016bb
155 R9_2018bb
156 prop_binch2016bb_multiBins_signal_bin8
157 prop_binch2016bb_multiBins_signal_bin7
158 R4_2018be
159 R3_2017be
160 R8_2016bb
161 prop_binch2017be_multiBins_signal_bin4
162 prop_binch2016be_multiBins_signal_bin5
163 prop_binch2016be_multiBins_signal_bin6
164 R9_2017be
165 prop_binch2018be_multiBins_signal_bin2
166 R5_2018bb
167 prop_binch2018bb_multiBins_control_bin5
168 prop_binch2017bb_multiBins_signal_bin4
169 prop_binch2018bb_multiBins_signal_bin3
170 R9_2018be
171 prop_binch2017be_multiBins_signal_bin5
172 prop_binch2016bb_multiBins_control_bin6
173 R8_2017bb
174 prop_binch2018bb_multiBins_control_bin4
175 prop_binch2018bb_multiBins_control_bin0
176 R5_2018be
177 prop_binch2017be_multiBins_signal_bin8
178 prop_binch2018be_multiBins_signal_bin7
179 prop_binch2016bb_multiBins_signal_bin4
180 R9_2016bb
−2 −1 0 1 2
−0.04 −0.02 0 0.02 0.04
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin2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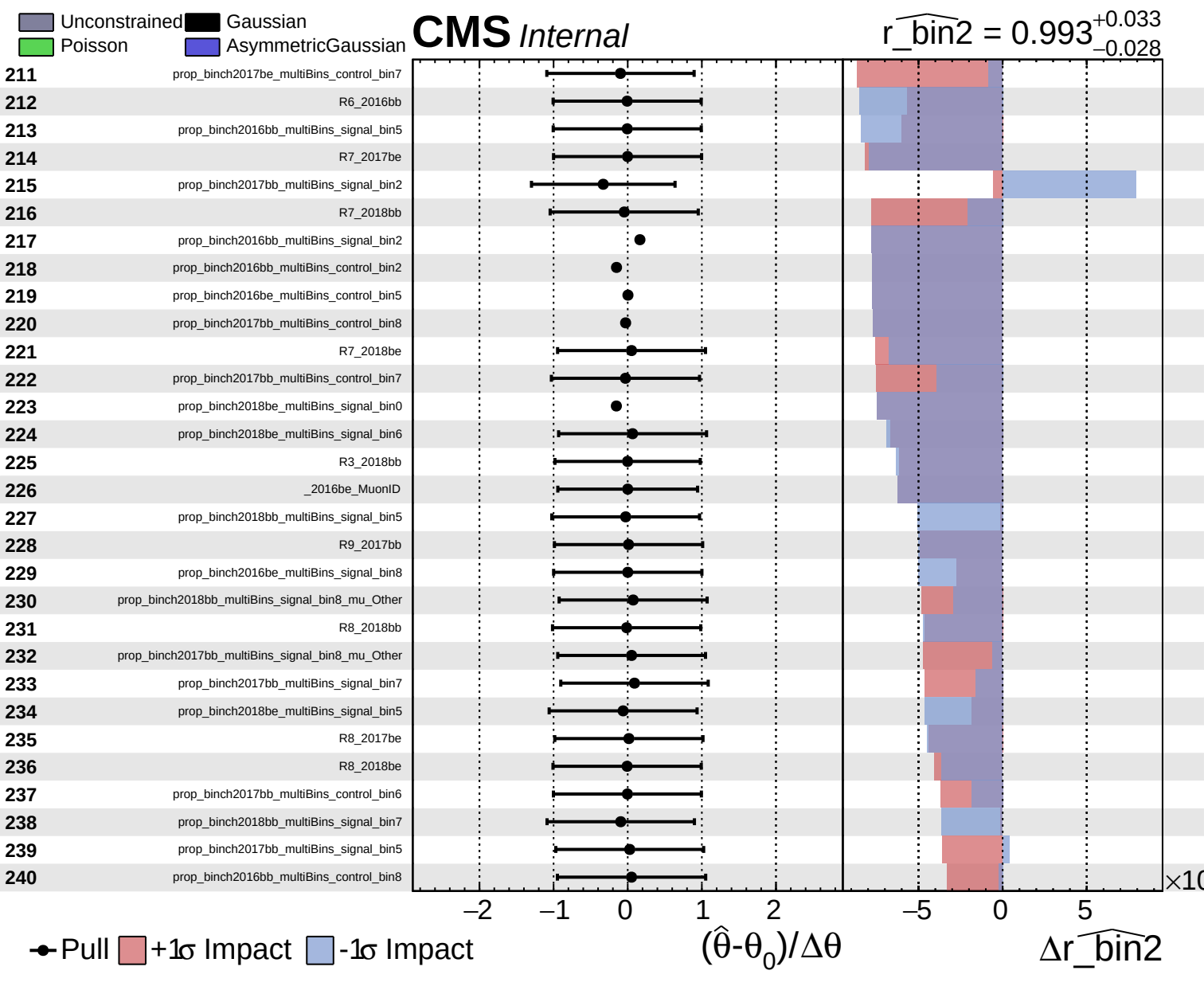
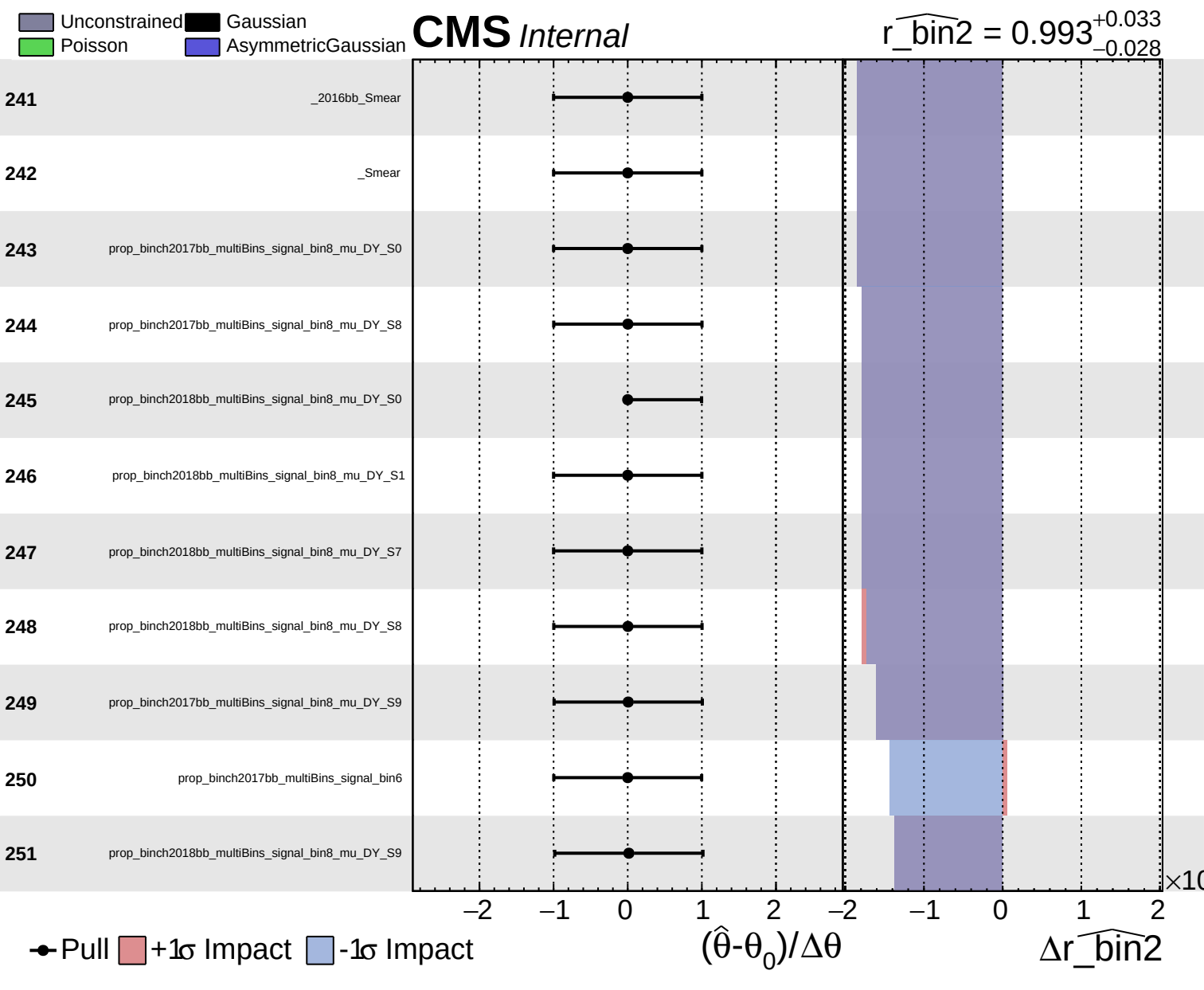
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin2 = 0.993 +0.033 −0.028
181 prop_binch2018bb_multiBins_signal_bin6
182 prop_binch2018be_multiBins_signal_bin4
183 R8_2016be
184 prop_binch2018be_multiBins_signal_bin3
185 prop_binch2018bb_multiBins_control_bin7
186 prop_binch2018be_multiBins_control_bin6
187 prop_binch2017be_multiBins_control_bin6
188 prop_binch2018bb_multiBins_control_bin8
189 prop_binch2016be_multiBins_control_bin6
190 prop_binch2018bb_multiBins_signal_bin4
191 prop_binch2018be_multiBins_signal_bin8
192 R7_2016be
193 prop_binch2018bb_multiBins_control_bin6
194 prop_binch2018be_multiBins_control_bin7
195 prop_binch2018be_multiBins_signal_bin1
196 Rel8_2016be
1.9 +1.8 −1.3
197 prop_binch2018be_multiBins_control_bin8
198 R9_2016be
199 R6_2017be
200 prop_binch2016be_multiBins_control_bin8
201 R6_2016be
202 prop_binch2017be_multiBins_signal_bin6
203 prop_binch2017bb_multiBins_control_bin5
204 prop_binch2017be_multiBins_signal_bin7
205 prop_binch2016be_multiBins_signal_bin7
206 R6_2018bb
207 R5_2017bb
208 R6_2018be
209 prop_binch2016be_multiBins_control_bin7
210 prop_binch2016bb_multiBins_control_bin5
−2 −1 0 1 2
−0.02 −0.01 0 0.01 0.02
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin2


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin2 = 0.993 +0.033 −0.028
211 prop_binch2017be_multiBins_control_bin7
212 R6_2016bb
213 prop_binch2016bb_multiBins_signal_bin5
214 R7_2017be
215 prop_binch2017bb_multiBins_signal_bin2
216 R7_2018bb
217 prop_binch2016bb_multiBins_signal_bin2
218 prop_binch2016bb_multiBins_control_bin2
219 prop_binch2016be_multiBins_control_bin5
220 prop_binch2017bb_multiBins_control_bin8
221 R7_2018be
222 prop_binch2017bb_multiBins_control_bin7
223 prop_binch2018be_multiBins_signal_bin0
224 prop_binch2018be_multiBins_signal_bin6
225 R3_2018bb
226 _2016be_MuonID
227 prop_binch2018bb_multiBins_signal_bin5
228 R9_2017bb
229 prop_binch2016be_multiBins_signal_bin8
230 prop_binch2018bb_multiBins_signal_bin8_mu_Other
231 R8_2018bb
232 prop_binch2017bb_multiBins_signal_bin8_mu_Other
233 prop_binch2017bb_multiBins_signal_bin7
234 prop_binch2018be_multiBins_signal_bin5
235 R8_2017be
236 R8_2018be
237 prop_binch2017bb_multiBins_control_bin6
238 prop_binch2018bb_multiBins_signal_bin7
239 prop_binch2017bb_multiBins_signal_bin5
240 prop_binch2016bb_multiBins_control_bin8
−2 −1 0 1 2
−5 0 5
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr_bin2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Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r_bin2 = 0.993 +0.033 −0.028
241 _2016bb_Smear
242 _Smear
243 prop_binch2017bb_multiBins_signal_bin8_mu_DY_S0
244 prop_binch2017bb_multiBins_signal_bin8_mu_DY_S8
245 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S0
246 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S1
247 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S7
248 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S8
249 prop_binch2017bb_multiBins_signal_bin8_mu_DY_S9
250 prop_binch2017bb_multiBins_signal_bin6
251 prop_binch2018bb_multiBins_signal_bin8_mu_DY_S9
−2 −1 0 1 2 −2 −1 0 1 2
×10
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr_bin2