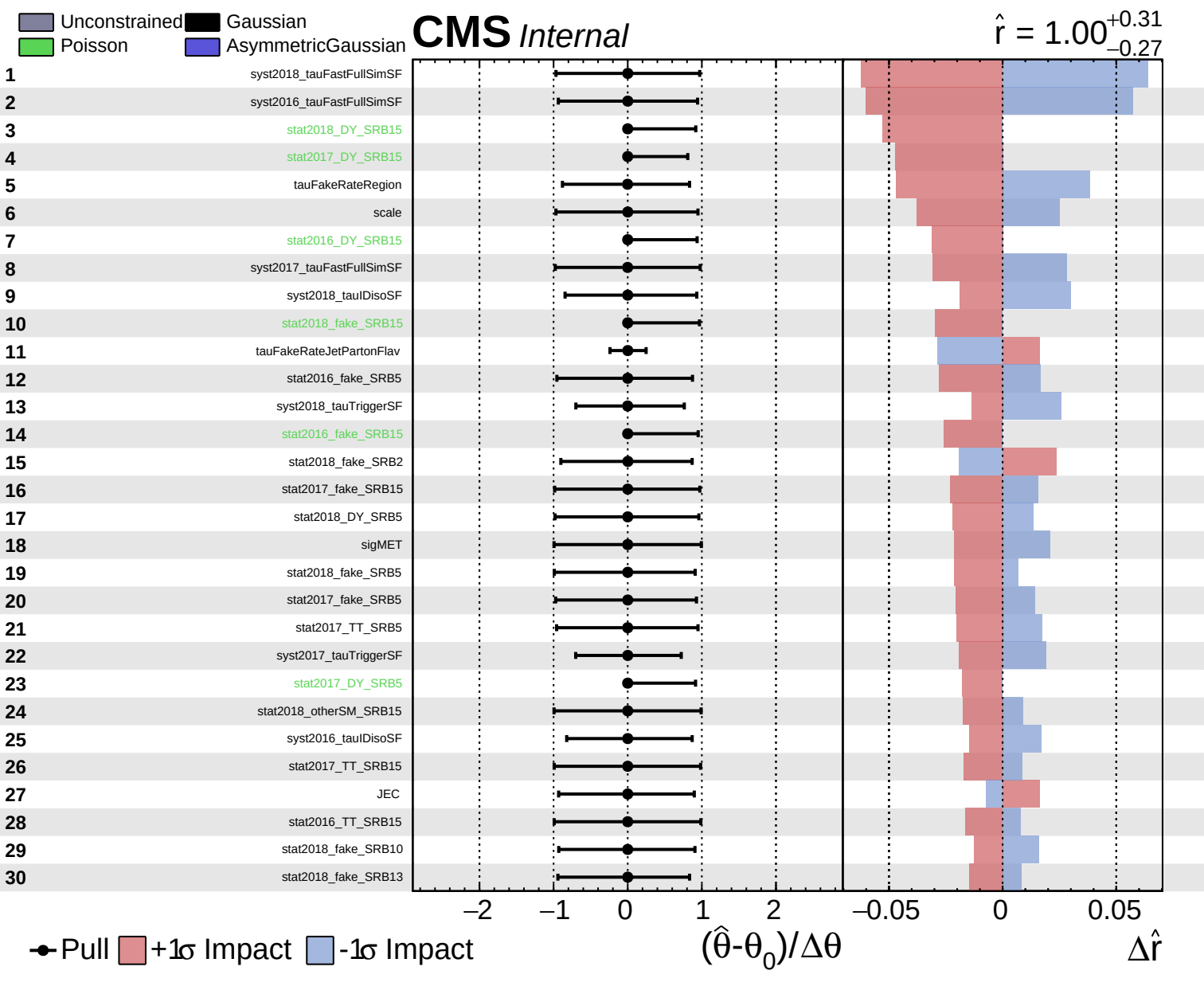
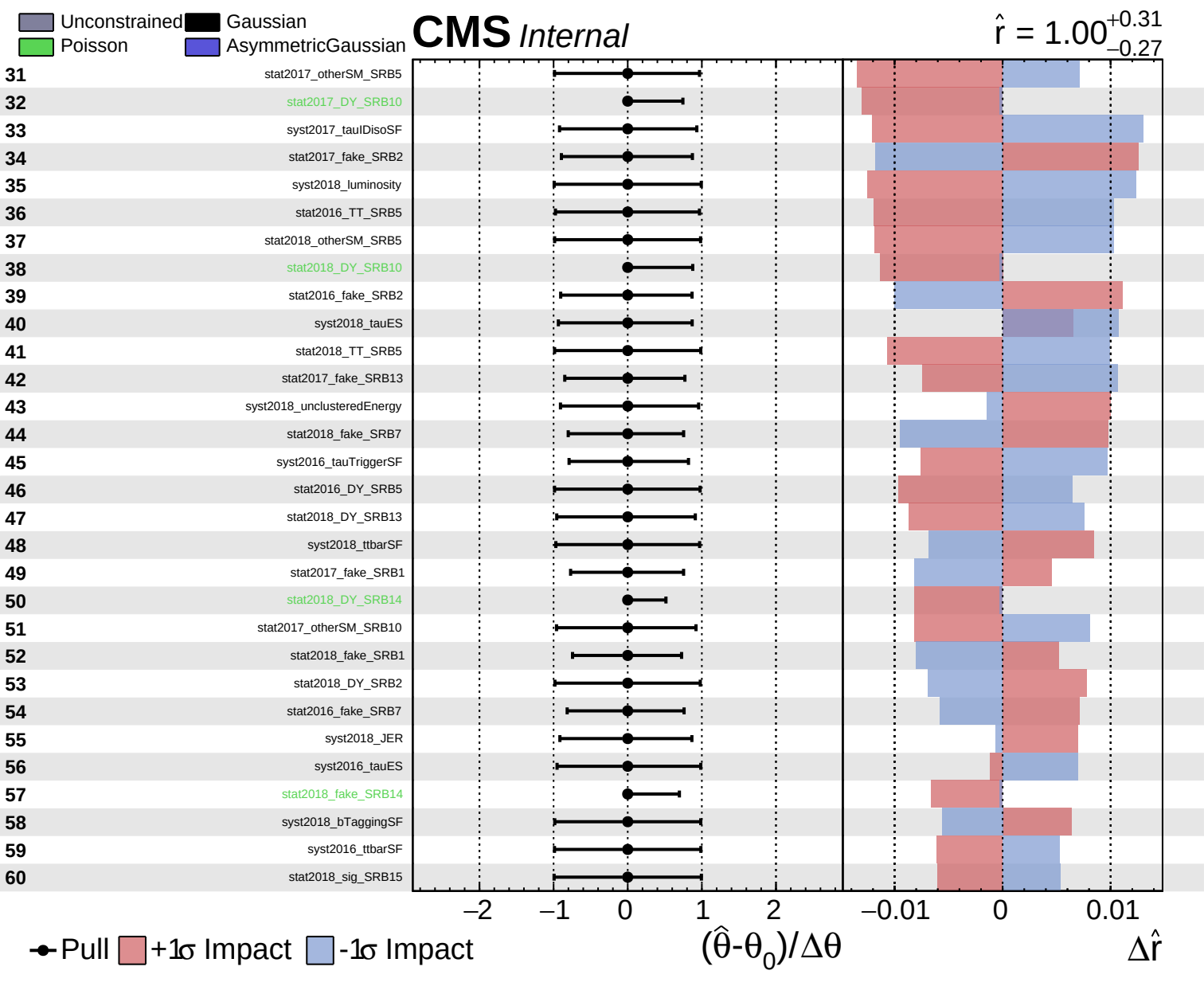
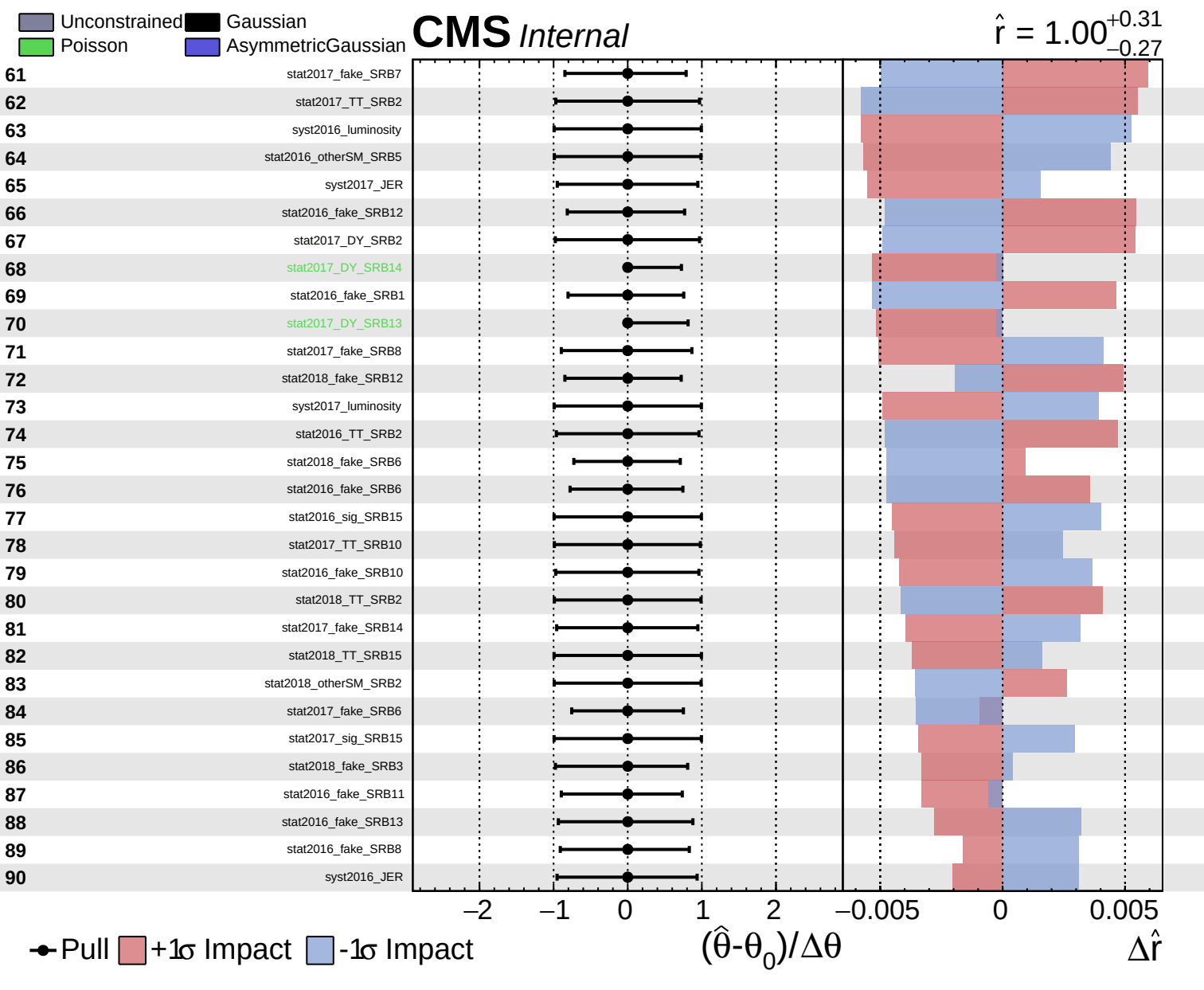
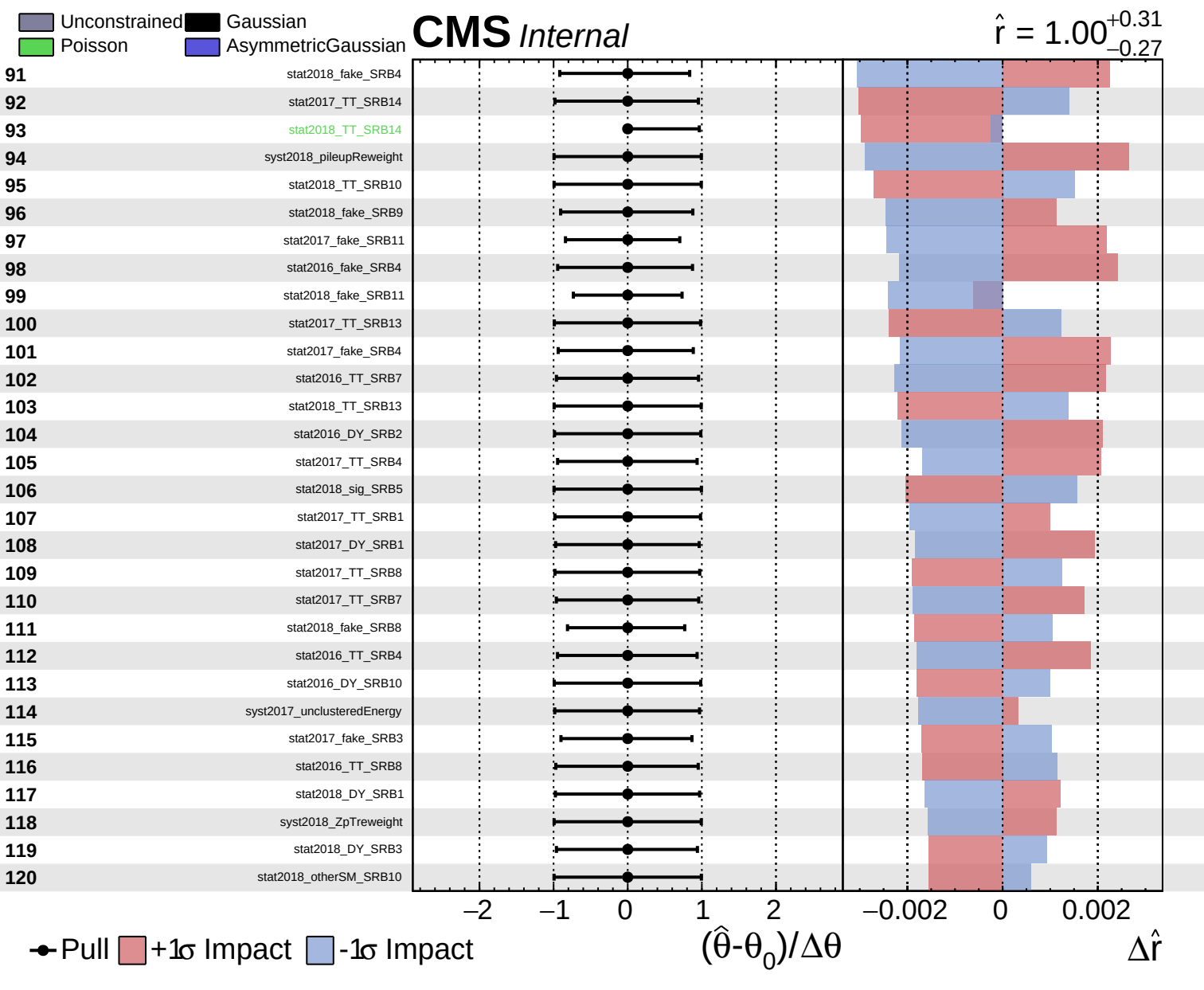
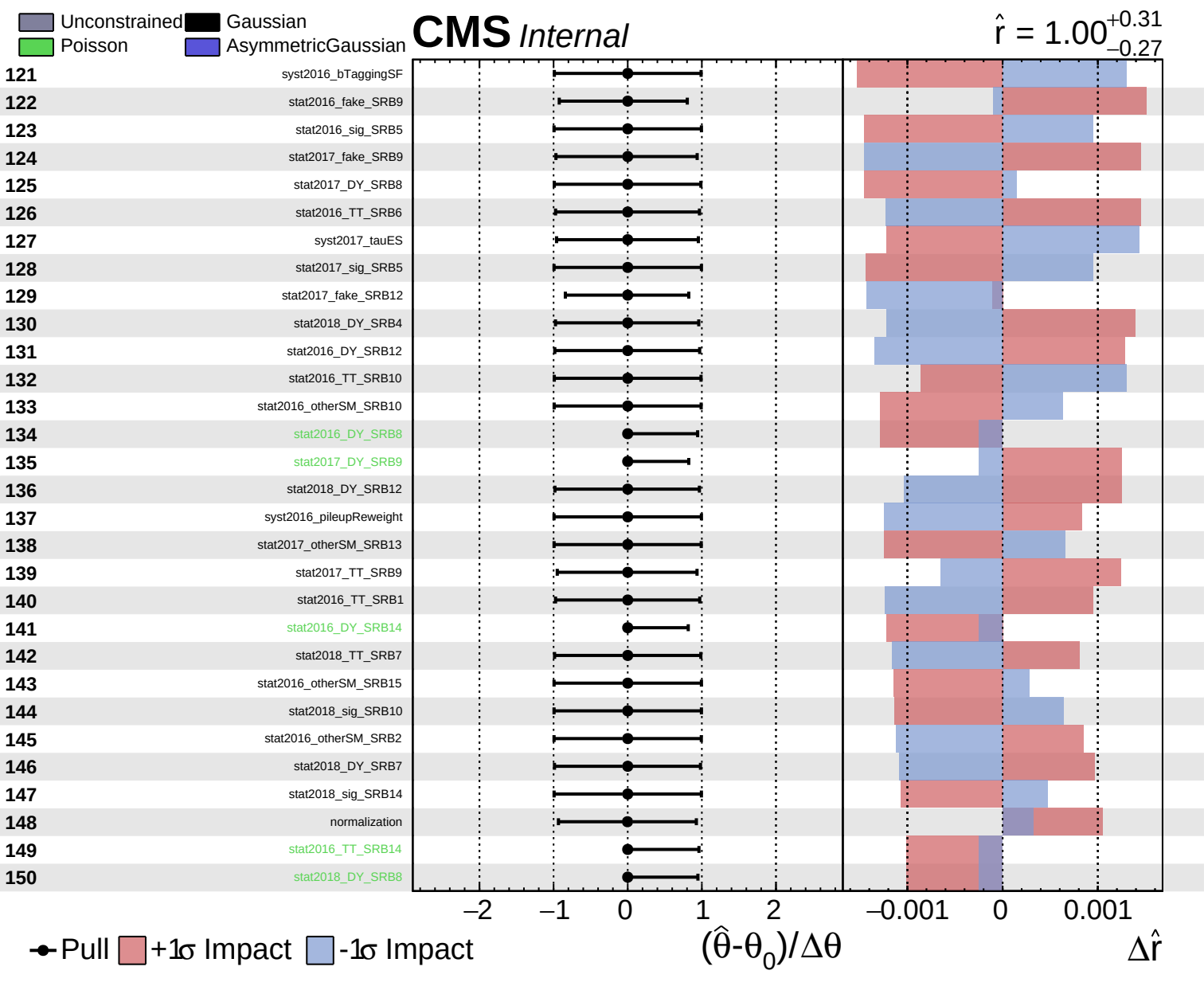
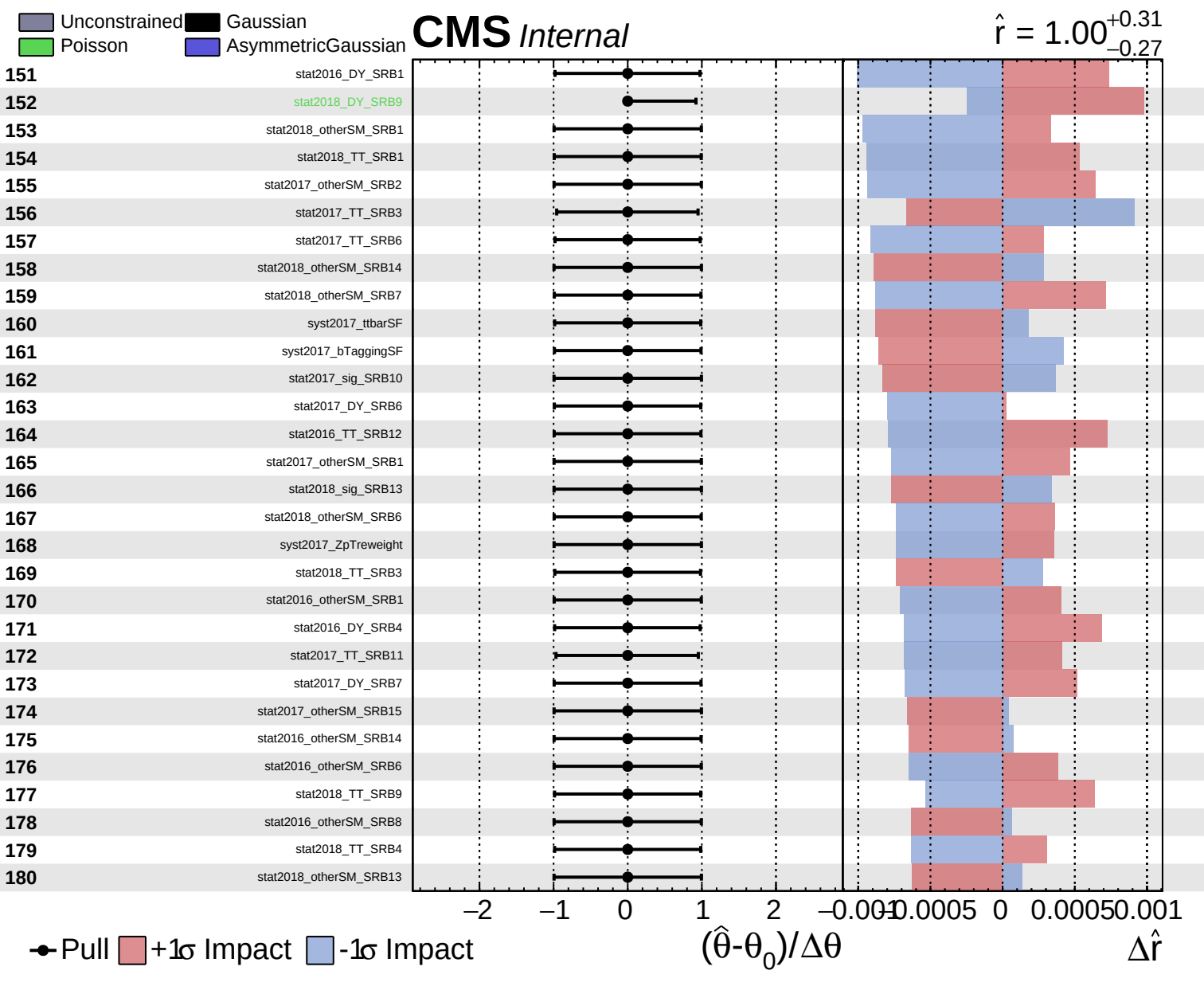

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.31 −0.27
1 syst2018_tauFastFullSimSF
2 syst2016_tauFastFullSimSF
3 stat2018_DY_SRB15
4 stat2017_DY_SRB15
5 tauFakeRateRegion
6 scale
7 stat2016_DY_SRB15
8 syst2017_tauFastFullSimSF
9 syst2018_tauIDisoSF
10 stat2018_fake_SRB15
11 tauFakeRateJetPartonFlav
12 stat2016_fake_SRB5
13 syst2018_tauTriggerSF
14 stat2016_fake_SRB15
15 stat2018_fake_SRB2
16 stat2017_fake_SRB15
17 stat2018_DY_SRB5
18 sigMET
19 stat2018_fake_SRB5
20 stat2017_fake_SRB5
21 stat2017_TT_SRB5
22 syst2017_tauTriggerSF
23 stat2017_DY_SRB5
24 stat2018_otherSM_SRB15
25 syst2016_tauIDisoSF
26 stat2017_TT_SRB15
27 JEC
28 stat2016_TT_SRB15
29 stat2018_fake_SRB10
30 stat2018_fake_SRB13
−2 −1 0 1 2
−0.05 0 0.05
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

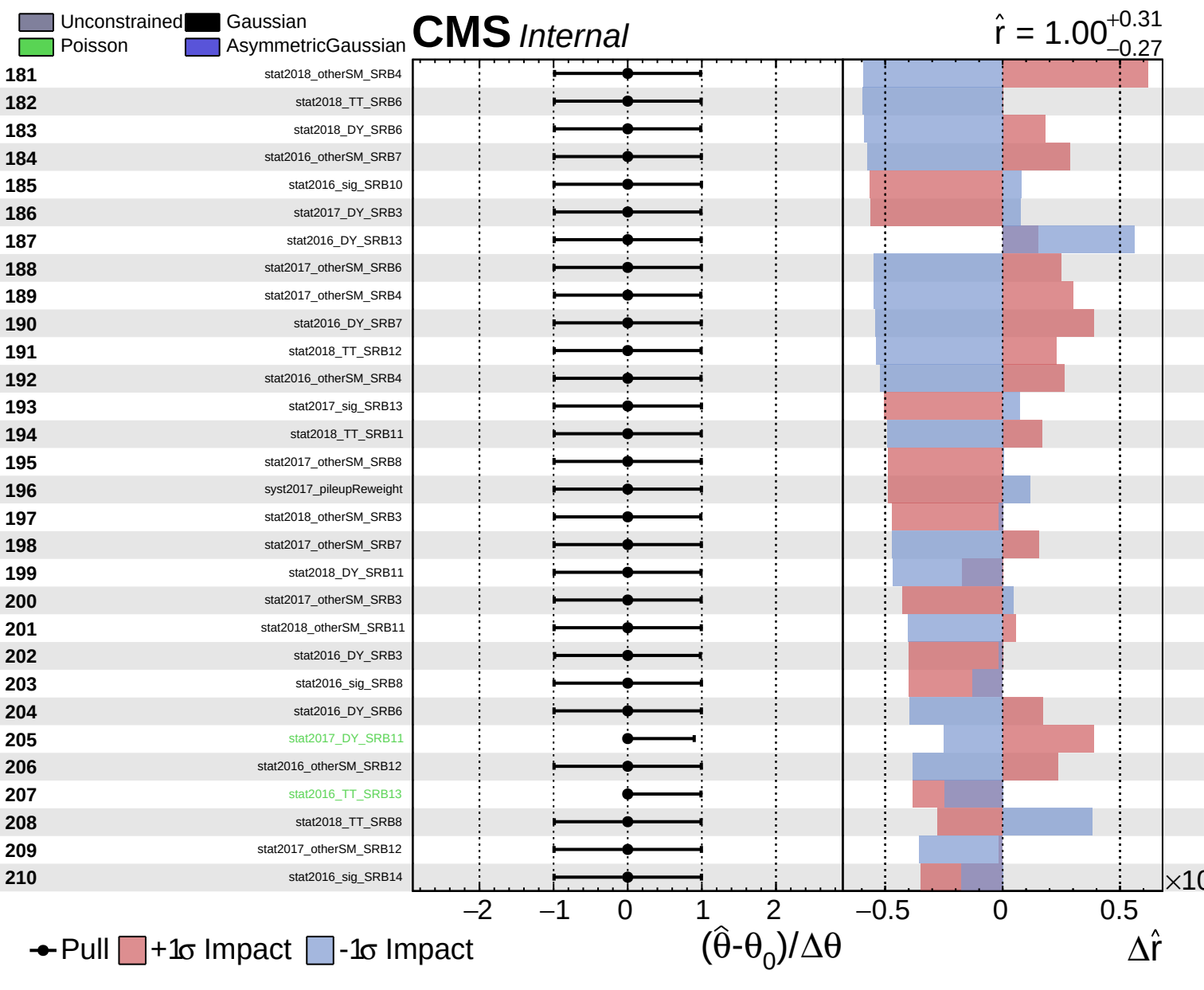

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.31 −0.27
31 stat2017_otherSM_SRB5
32 stat2017_DY_SRB10
33 syst2017_tauIDisoSF
34 stat2017_fake_SRB2
35 syst2018_luminosity
36 stat2016_TT_SRB5
37 stat2018_otherSM_SRB5
38 stat2018_DY_SRB10
39 stat2016_fake_SRB2
40 syst2018_tauES
41 stat2018_TT_SRB5
42 stat2017_fake_SRB13
43 syst2018_unclusteredEnergy
44 stat2018_fake_SRB7
45 syst2016_tauTriggerSF
46 stat2016_DY_SRB5
47 stat2018_DY_SRB13
48 syst2018_ttbarSF
49 stat2017_fake_SRB1
50 stat2018_DY_SRB14
51 stat2017_otherSM_SRB10
52 stat2018_fake_SRB1
53 stat2018_DY_SRB2
54 stat2016_fake_SRB7
55 syst2018_JER
56 syst2016_tauES
57 stat2018_fake_SRB14
58 syst2018_bTaggingSF
59 syst2016_ttbarSF
60 stat2018_sig_SRB15
−2
−1
0
1
2
−0.01
0
0.01
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂

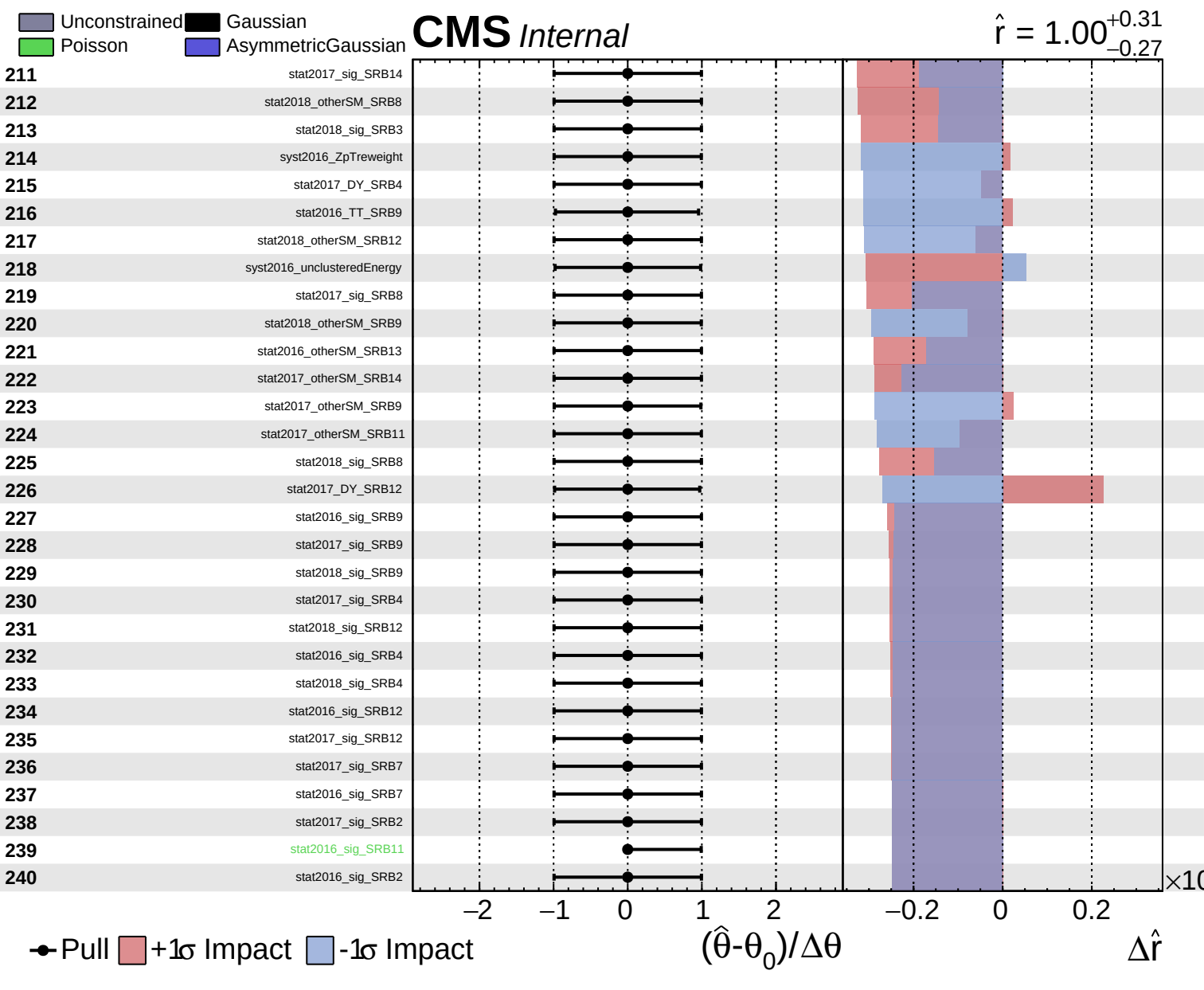

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.31 −0.27
61 stat2017_fake_SRB7
62 stat2017_TT_SRB2
63 syst2016_luminosity
64 stat2016_otherSM_SRB5
65 syst2017_JER
66 stat2016_fake_SRB12
67 stat2017_DY_SRB2
68 stat2017_DY_SRB14
69 stat2016_fake_SRB1
70 stat2017_DY_SRB13
71 stat2017_fake_SRB8
72 stat2018_fake_SRB12
73 syst2017_luminosity
74 stat2016_TT_SRB2
75 stat2018_fake_SRB6
76 stat2016_fake_SRB6
77 stat2016_sig_SRB15
78 stat2017_TT_SRB10
79 stat2016_fake_SRB10
80 stat2018_TT_SRB2
81 stat2017_fake_SRB14
82 stat2018_TT_SRB15
83 stat2018_otherSM_SRB2
84 stat2017_fake_SRB6
85 stat2017_sig_SRB15
86 stat2018_fake_SRB3
87 stat2016_fake_SRB11
88 stat2016_fake_SRB13
89 stat2016_fake_SRB8
90 syst2016_JER
−2 −1 0 1 2
−0.005 0 0.005
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

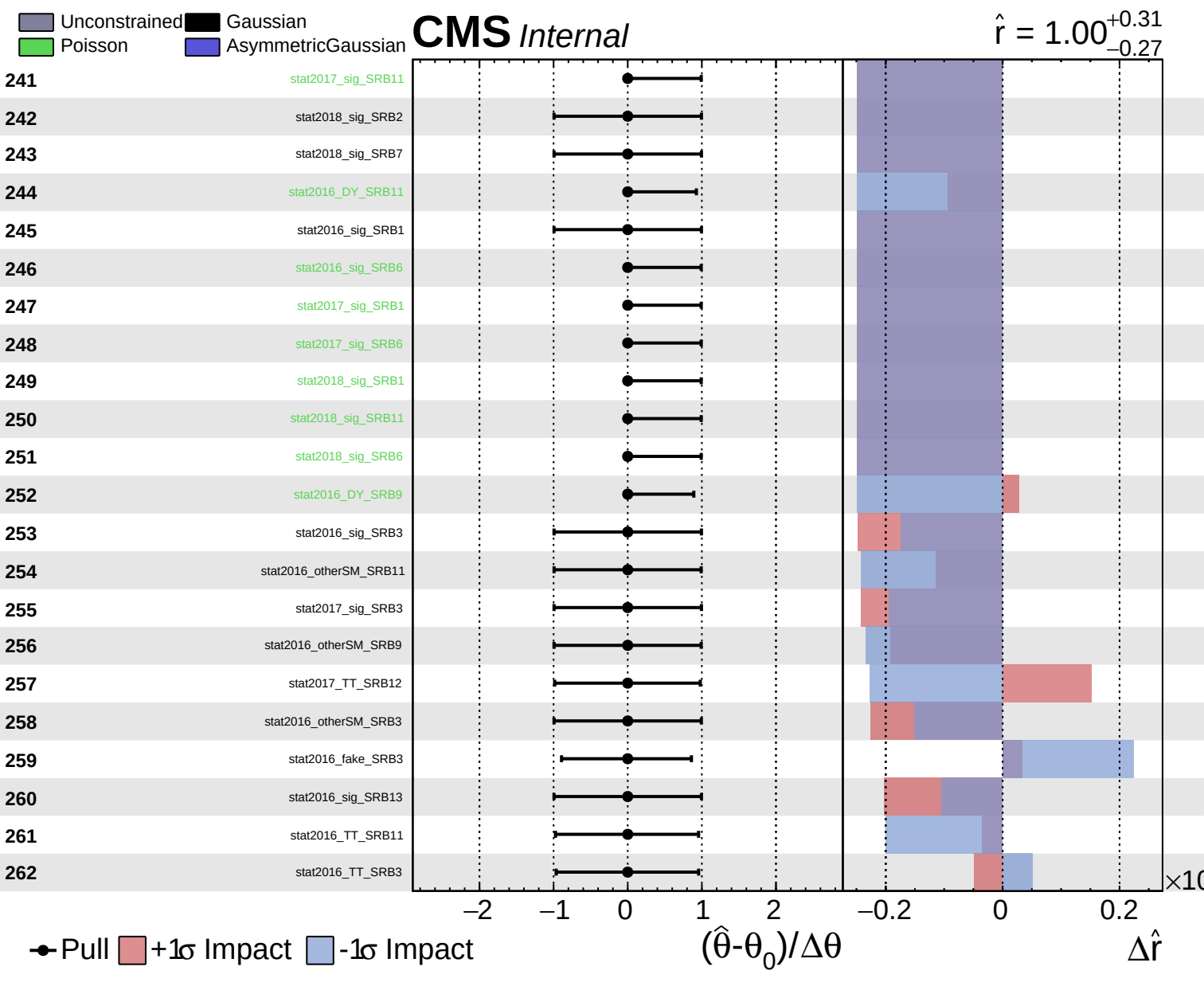

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.31 −0.27
91 stat2018_fake_SRB4
92 stat2017_TT_SRB14
93 stat2018_TT_SRB14
94 syst2018_pileupReweight
95 stat2018_TT_SRB10
96 stat2018_fake_SRB9
97 stat2017_fake_SRB11
98 stat2016_fake_SRB4
99 stat2018_fake_SRB11
100 stat2017_TT_SRB13
101 stat2017_fake_SRB4
102 stat2016_TT_SRB7
103 stat2018_TT_SRB13
104 stat2016_DY_SRB2
105 stat2017_TT_SRB4
106 stat2018_sig_SRB5
107 stat2017_TT_SRB1
108 stat2017_DY_SRB1
109 stat2017_TT_SRB8
110 stat2017_TT_SRB7
111 stat2018_fake_SRB8
112 stat2016_TT_SRB4
113 stat2016_DY_SRB10
114 syst2017_unclusteredEnergy
115 stat2017_fake_SRB3
116 stat2016_TT_SRB8
117 stat2018_DY_SRB1
118 syst2018_ZpTreweight
119 stat2018_DY_SRB3
120 stat2018_otherSM_SRB10
−2 −1 0 1 2
−0.002 0 0.002
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.31 −0.27
121 syst2016_bTaggingSF
122 stat2016_fake_SRB9
123 stat2016_sig_SRB5
124 stat2017_fake_SRB9
125 stat2017_DY_SRB8
126 stat2016_TT_SRB6
127 syst2017_tauES
128 stat2017_sig_SRB5
129 stat2017_fake_SRB12
130 stat2018_DY_SRB4
131 stat2016_DY_SRB12
132 stat2016_TT_SRB10
133 stat2016_otherSM_SRB10
134 stat2016_DY_SRB8
135 stat2017_DY_SRB9
136 stat2018_DY_SRB12
137 syst2016_pileupReweight
138 stat2017_otherSM_SRB13
139 stat2017_TT_SRB9
140 stat2016_TT_SRB1
141 stat2016_DY_SRB14
142 stat2018_TT_SRB7
143 stat2016_otherSM_SRB15
144 stat2018_sig_SRB10
145 stat2016_otherSM_SRB2
146 stat2018_DY_SRB7
147 stat2018_sig_SRB14
148 normalization
149 stat2016_TT_SRB14
150 stat2018_DY_SRB8
−2
−1
0
1
2
−0.001
0
0.001
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.31 −0.27
151 stat2016_DY_SRB1
152 stat2018_DY_SRB9
153 stat2018_otherSM_SRB1
154 stat2018_TT_SRB1
155 stat2017_otherSM_SRB2
156 stat2017_TT_SRB3
157 stat2017_TT_SRB6
158 stat2018_otherSM_SRB14
159 stat2018_otherSM_SRB7
160 syst2017_ttbarSF
161 syst2017_bTaggingSF
162 stat2017_sig_SRB10
163 stat2017_DY_SRB6
164 stat2016_TT_SRB12
165 stat2017_otherSM_SRB1
166 stat2018_sig_SRB13
167 stat2018_otherSM_SRB6
168 syst2017_ZpTreweight
169 stat2018_TT_SRB3
170 stat2016_otherSM_SRB1
171 stat2016_DY_SRB4
172 stat2017_TT_SRB11
173 stat2017_DY_SRB7
174 stat2017_otherSM_SRB15
175 stat2016_otherSM_SRB14
176 stat2016_otherSM_SRB6
177 stat2018_TT_SRB9
178 stat2016_otherSM_SRB8
179 stat2018_TT_SRB4
180 stat2018_otherSM_SRB13
−2 −1 0 1 2
−0.001 −0.0005 0 0.0005 0.001
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.31 −0.27
181 stat2018_otherSM_SRB4
182 stat2018_TT_SRB6
183 stat2018_DY_SRB6
184 stat2016_otherSM_SRB7
185 stat2016_sig_SRB10
186 stat2017_DY_SRB3
187 stat2016_DY_SRB13
188 stat2017_otherSM_SRB6
189 stat2017_otherSM_SRB4
190 stat2016_DY_SRB7
191 stat2018_TT_SRB12
192 stat2016_otherSM_SRB4
193 stat2017_sig_SRB13
194 stat2018_TT_SRB11
195 stat2017_otherSM_SRB8
196 syst2017_pileupReweight
197 stat2018_otherSM_SRB3
198 stat2017_otherSM_SRB7
199 stat2018_DY_SRB11
200 stat2017_otherSM_SRB3
201 stat2018_otherSM_SRB11
202 stat2016_DY_SRB3
203 stat2016_sig_SRB8
204 stat2016_DY_SRB6
205 stat2017_DY_SRB11
206 stat2016_otherSM_SRB12
207 stat2016_TT_SRB13
208 stat2018_TT_SRB8
209 stat2017_otherSM_SRB12
210 stat2016_sig_SRB14
×10
−2 −1 0 1 2
−0.5 0 0.5
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.31 −0.27
211 stat2017_sig_SRB14
212 stat2018_otherSM_SRB8
213 stat2018_sig_SRB3
214 syst2016_ZpTreweight
215 stat2017_DY_SRB4
216 stat2016_TT_SRB9
217 stat2018_otherSM_SRB12
218 syst2016_unclusteredEnergy
219 stat2017_sig_SRB8
220 stat2018_otherSM_SRB9
221 stat2016_otherSM_SRB13
222 stat2017_otherSM_SRB14
223 stat2017_otherSM_SRB9
224 stat2017_otherSM_SRB11
225 stat2018_sig_SRB8
226 stat2017_DY_SRB12
227 stat2016_sig_SRB9
228 stat2017_sig_SRB9
229 stat2018_sig_SRB9
230 stat2017_sig_SRB4
231 stat2018_sig_SRB12
232 stat2016_sig_SRB4
233 stat2018_sig_SRB4
234 stat2016_sig_SRB12
235 stat2017_sig_SRB12
236 stat2017_sig_SRB7
237 stat2016_sig_SRB7
238 stat2017_sig_SRB2
239 stat2016_sig_SRB11
240 stat2016_sig_SRB2
×10
−2
−1
0
1
2
−0.2
0
0.2
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.31 −0.27
241 stat2017_sig_SRB11
242 stat2018_sig_SRB2
243 stat2018_sig_SRB7
244 stat2016_DY_SRB11
245 stat2016_sig_SRB1
246 stat2016_sig_SRB6
247 stat2017_sig_SRB1
248 stat2017_sig_SRB6
249 stat2018_sig_SRB1
250 stat2018_sig_SRB11
251 stat2018_sig_SRB6
252 stat2016_DY_SRB9
253 stat2016_sig_SRB3
254 stat2016_otherSM_SRB11
255 stat2017_sig_SRB3
256 stat2016_otherSM_SRB9
257 stat2017_TT_SRB12
258 stat2016_otherSM_SRB3
259 stat2016_fake_SRB3
260 stat2016_sig_SRB13
261 stat2016_TT_SRB11
262 stat2016_TT_SRB3
×10
−2 −1 0 1 2
−0.2 0 0.2
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂