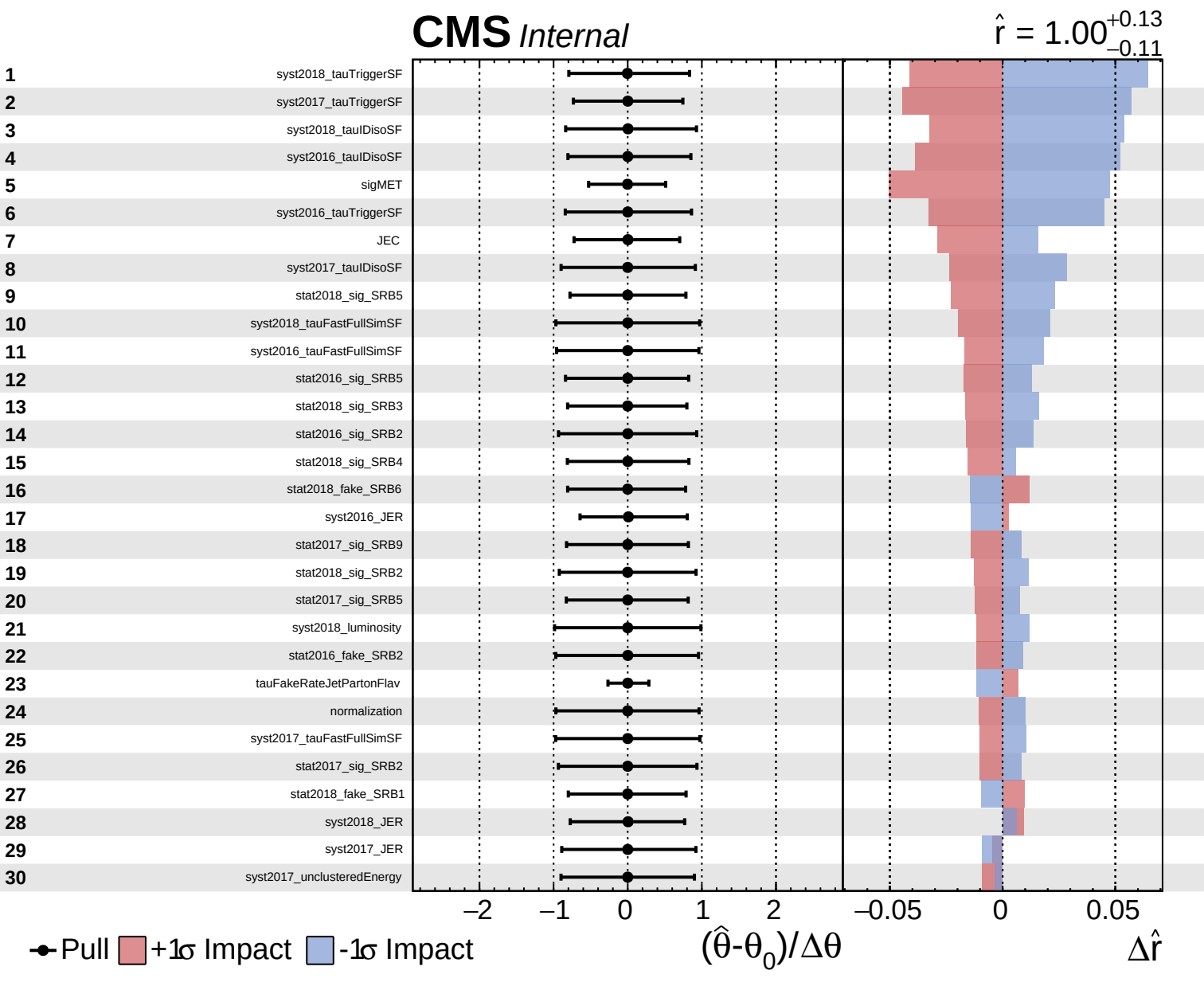
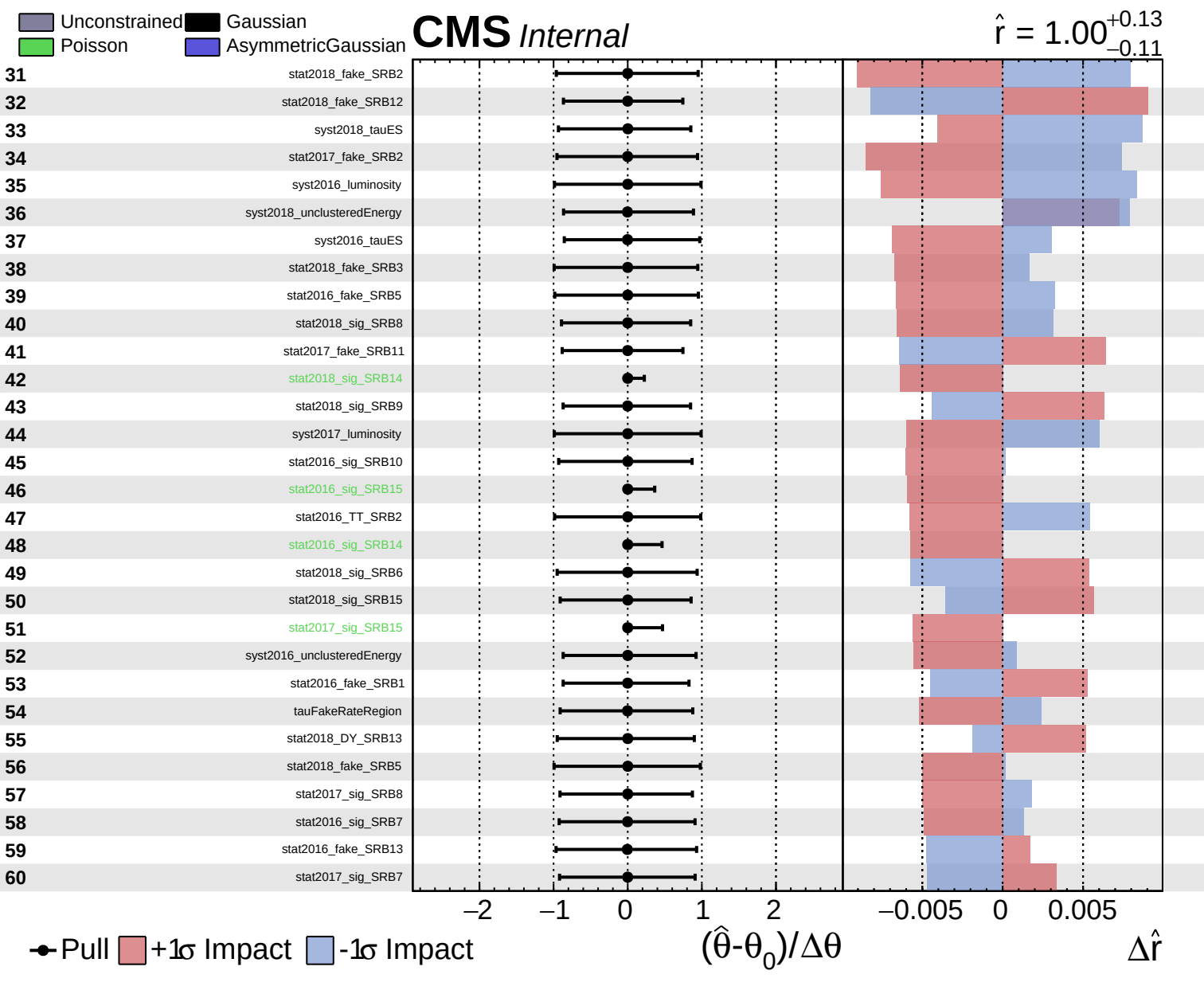
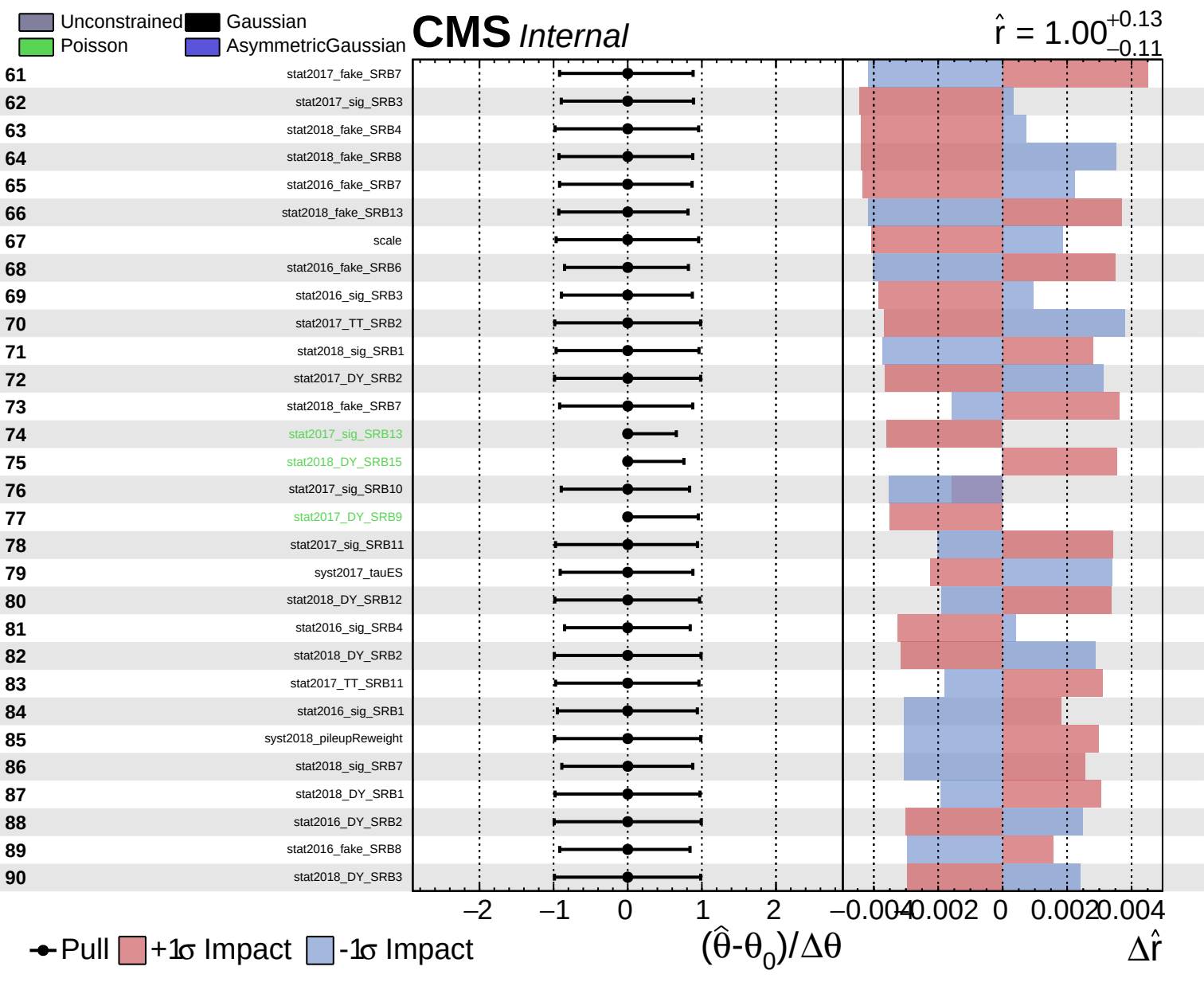
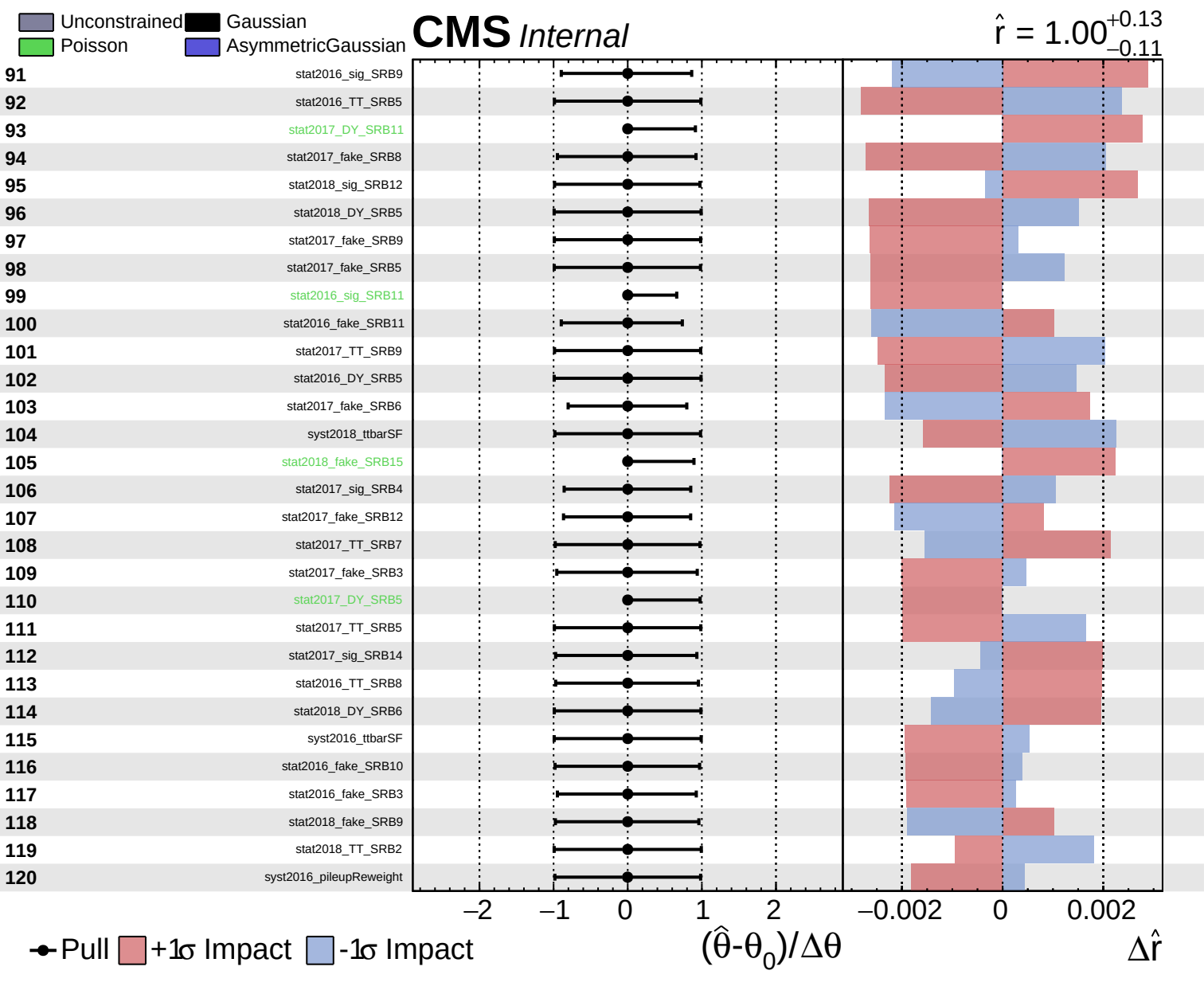
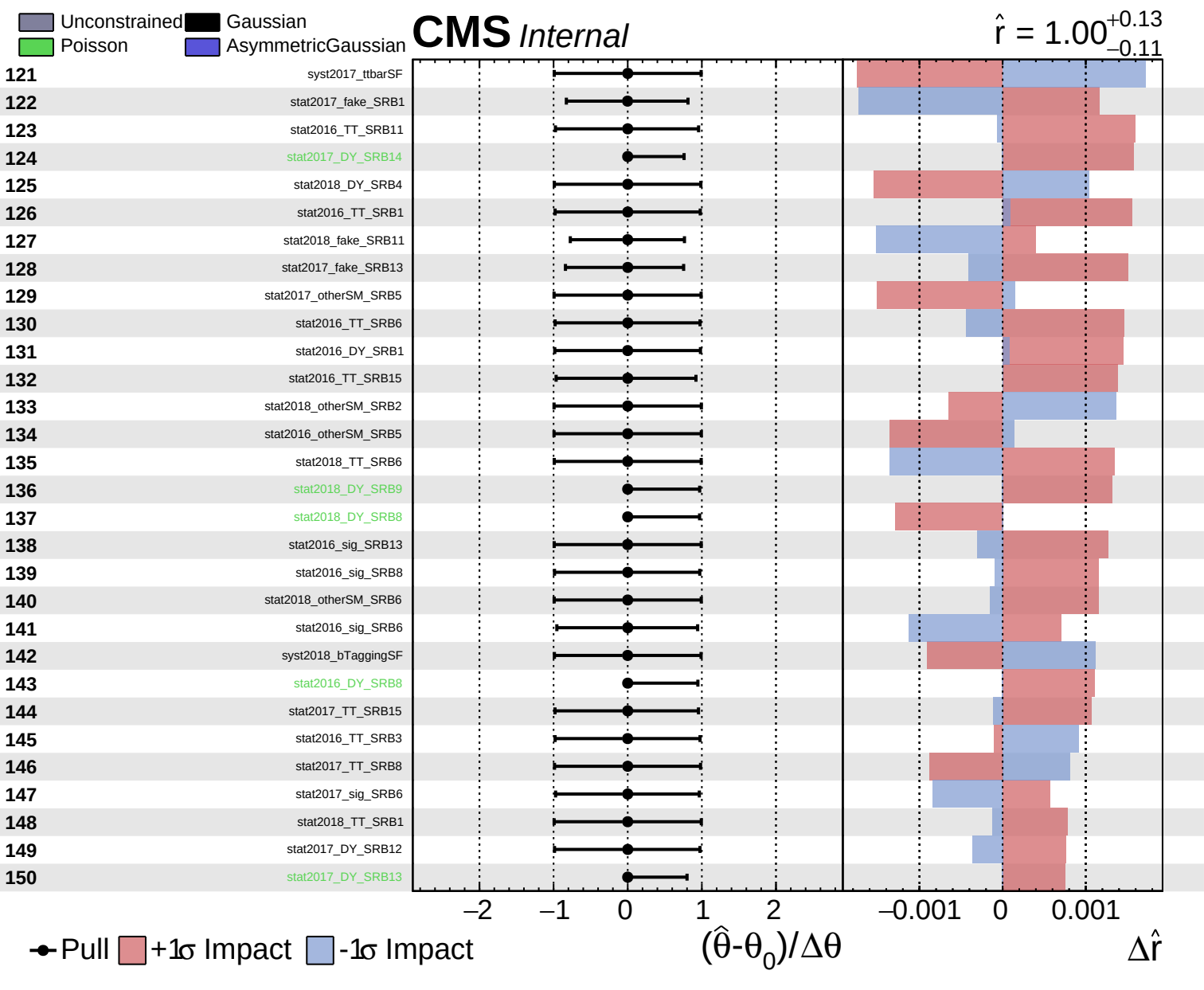
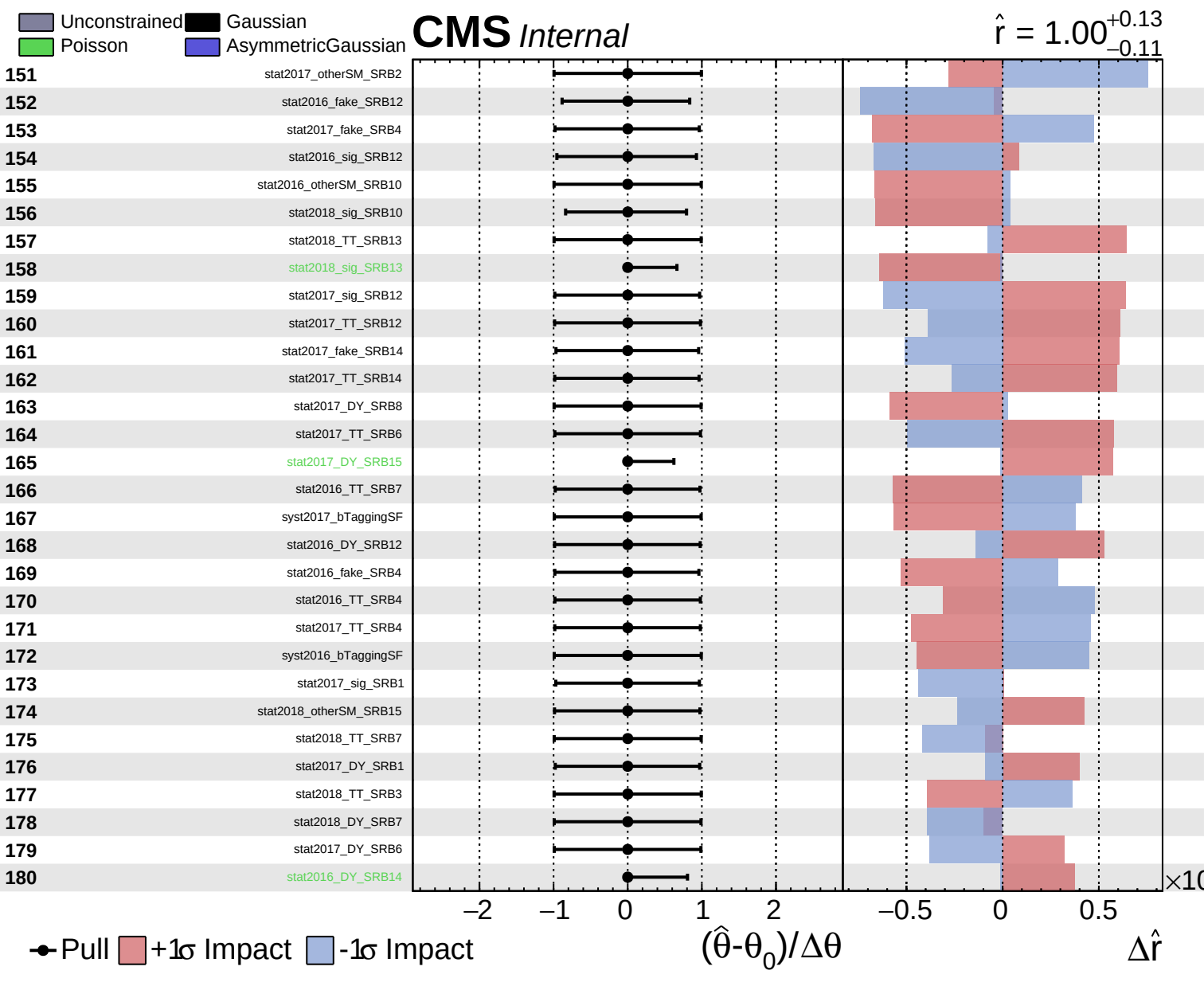

CMS Internal
r̂ = 1.00 +0.13 −0.11
1 syst2018_tauTriggerSF
2 syst2017_tauTriggerSF
3 syst2018_tauIDisoSF
4 syst2016_tauIDisoSF
5 sigMET
6 syst2016_tauTriggerSF
7 JEC
8 syst2017_tauIDisoSF
9 stat2018_sig_SRB5
10 syst2018_tauFastFullSimSF
11 syst2016_tauFastFullSimSF
12 stat2016_sig_SRB5
13 stat2018_sig_SRB3
14 stat2016_sig_SRB2
15 stat2018_sig_SRB4
16 stat2018_fake_SRB6
17 syst2016_JER
18 stat2017_sig_SRB9
19 stat2018_sig_SRB2
20 stat2017_sig_SRB5
21 syst2018_luminosity
22 stat2016_fake_SRB2
23 tauFakeRateJetPartonFlav
24 normalization
25 syst2017_tauFastFullSimSF
26 stat2017_sig_SRB2
27 stat2018_fake_SRB1
28 syst2018_JER
29 syst2017_JER
30 syst2017_unclusteredEnergy
−2 −1 0 1 2
−0.05 0 0.05
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

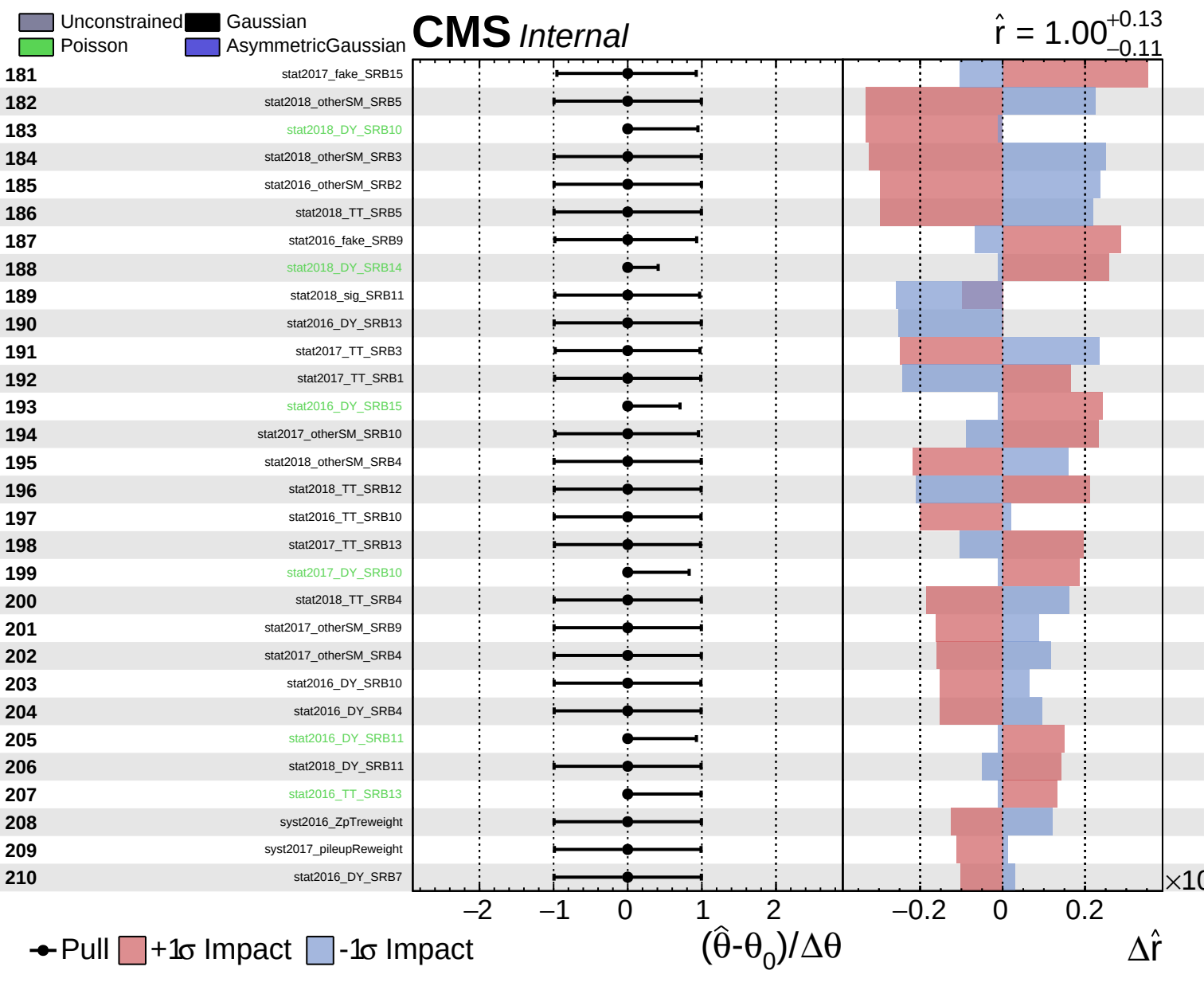

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.13 −0.11
31 stat2018_fake_SRB2
32 stat2018_fake_SRB12
33 syst2018_tauES
34 stat2017_fake_SRB2
35 syst2016_luminosity
36 syst2018_unclusteredEnergy
37 syst2016_tauES
38 stat2018_fake_SRB3
39 stat2016_fake_SRB5
40 stat2018_sig_SRB8
41 stat2017_fake_SRB11
42 stat2018_sig_SRB14
43 stat2018_sig_SRB9
44 syst2017_luminosity
45 stat2016_sig_SRB10
46 stat2016_sig_SRB15
47 stat2016_TT_SRB2
48 stat2016_sig_SRB14
49 stat2018_sig_SRB6
50 stat2018_sig_SRB15
51 stat2017_sig_SRB15
52 syst2016_unclusteredEnergy
53 stat2016_fake_SRB1
54 tauFakeRateRegion
55 stat2018_DY_SRB13
56 stat2018_fake_SRB5
57 stat2017_sig_SRB8
58 stat2016_sig_SRB7
59 stat2016_fake_SRB13
60 stat2017_sig_SRB7
−2 −1 0 1 2
−0.005 0 0.005
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

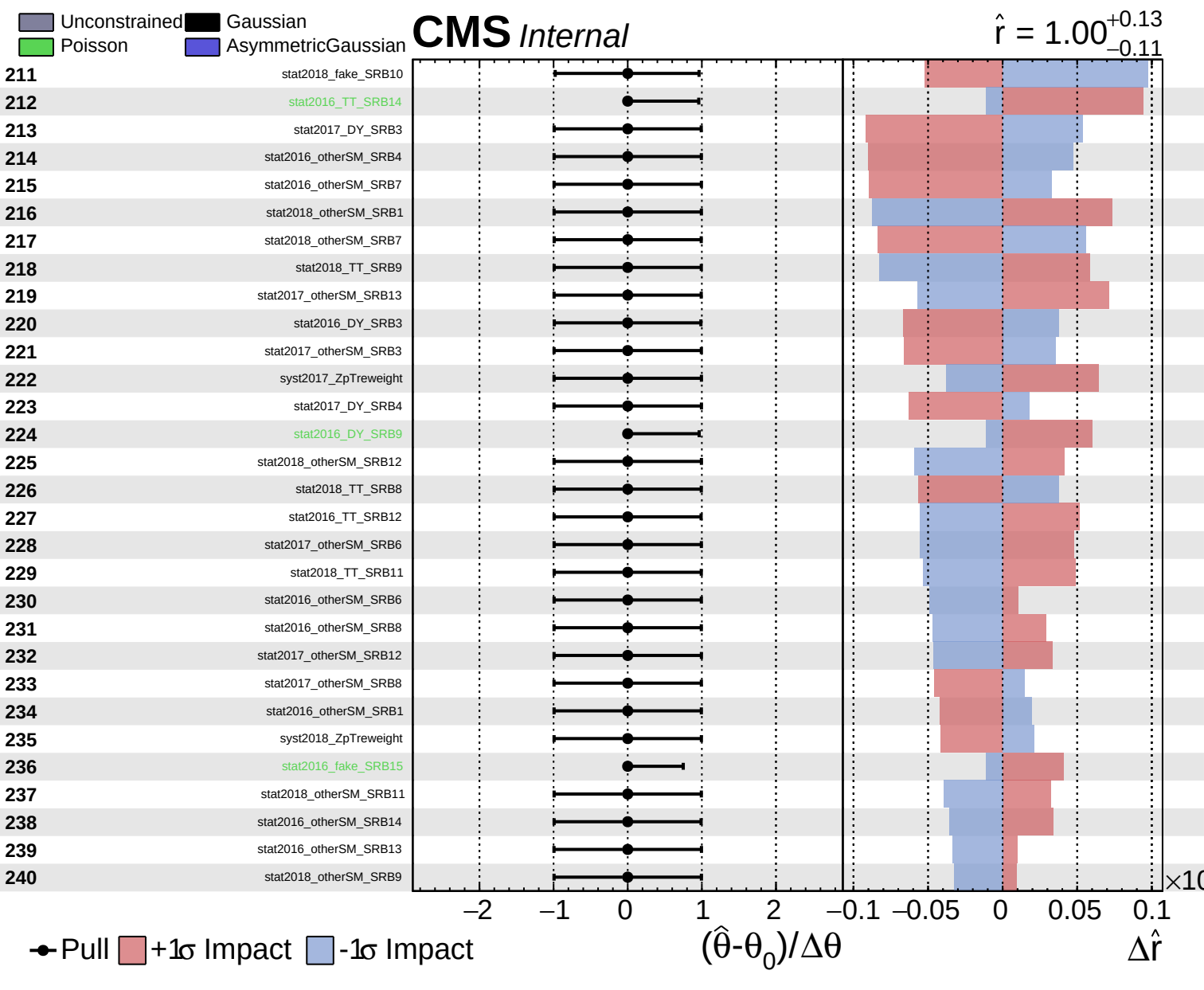

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.13 −0.11
61 stat2017_fake_SRB7
62 stat2017_sig_SRB3
63 stat2018_fake_SRB4
64 stat2018_fake_SRB8
65 stat2016_fake_SRB7
66 stat2018_fake_SRB13
67 scale
68 stat2016_fake_SRB6
69 stat2016_sig_SRB3
70 stat2017_TT_SRB2
71 stat2018_sig_SRB1
72 stat2017_DY_SRB2
73 stat2018_fake_SRB7
74 stat2017_sig_SRB13
75 stat2018_DY_SRB15
76 stat2017_sig_SRB10
77 stat2017_DY_SRB9
78 stat2017_sig_SRB11
79 syst2017_tauES
80 stat2018_DY_SRB12
81 stat2016_sig_SRB4
82 stat2018_DY_SRB2
83 stat2017_TT_SRB11
84 stat2016_sig_SRB1
85 syst2018_pileupReweight
86 stat2018_sig_SRB7
87 stat2018_DY_SRB1
88 stat2016_DY_SRB2
89 stat2016_fake_SRB8
90 stat2018_DY_SRB3
−2 −1 0 1 2
−0.004 −0.002 0 0.002 0.004
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

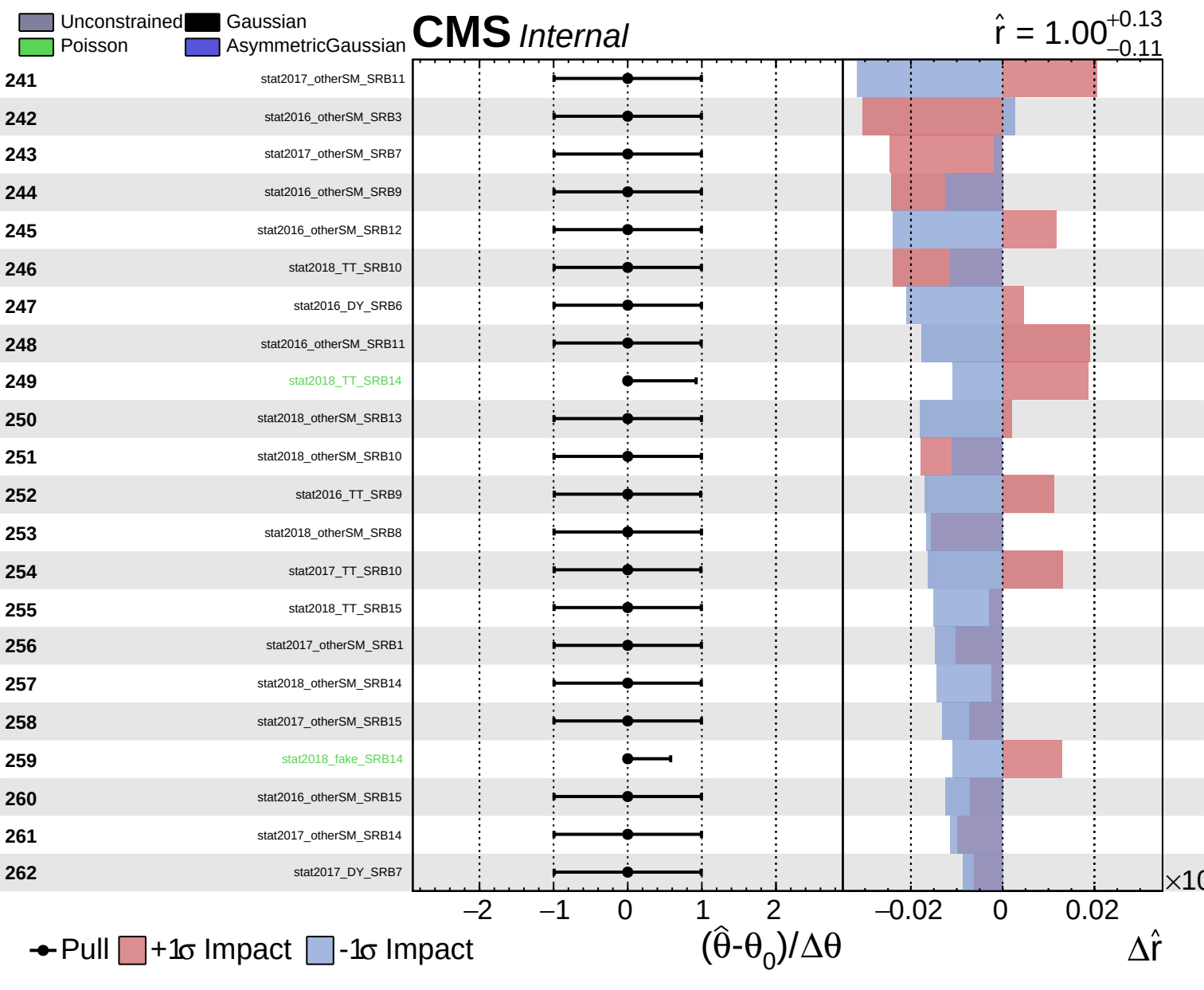

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.13 −0.11
91 stat2016_sig_SRB9
92 stat2016_TT_SRB5
93 stat2017_DY_SRB11
94 stat2017_fake_SRB8
95 stat2018_sig_SRB12
96 stat2018_DY_SRB5
97 stat2017_fake_SRB9
98 stat2017_fake_SRB5
99 stat2016_sig_SRB11
100 stat2016_fake_SRB11
101 stat2017_TT_SRB9
102 stat2016_DY_SRB5
103 stat2017_fake_SRB6
104 syst2018_ttbarSF
105 stat2018_fake_SRB15
106 stat2017_sig_SRB4
107 stat2017_fake_SRB12
108 stat2017_TT_SRB7
109 stat2017_fake_SRB3
110 stat2017_DY_SRB5
111 stat2017_TT_SRB5
112 stat2017_sig_SRB14
113 stat2016_TT_SRB8
114 stat2018_DY_SRB6
115 syst2016_ttbarSF
116 stat2016_fake_SRB10
117 stat2016_fake_SRB3
118 stat2018_fake_SRB9
119 stat2018_TT_SRB2
120 syst2016_pileupReweight
−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 +0.13 −0.11
121 syst2017_ttbarSF
122 stat2017_fake_SRB1
123 stat2016_TT_SRB11
124 stat2017_DY_SRB14
125 stat2018_DY_SRB4
126 stat2016_TT_SRB1
127 stat2018_fake_SRB11
128 stat2017_fake_SRB13
129 stat2017_otherSM_SRB5
130 stat2016_TT_SRB6
131 stat2016_DY_SRB1
132 stat2016_TT_SRB15
133 stat2018_otherSM_SRB2
134 stat2016_otherSM_SRB5
135 stat2018_TT_SRB6
136 stat2018_DY_SRB9
137 stat2018_DY_SRB8
138 stat2016_sig_SRB13
139 stat2016_sig_SRB8
140 stat2018_otherSM_SRB6
141 stat2016_sig_SRB6
142 syst2018_bTaggingSF
143 stat2016_DY_SRB8
144 stat2017_TT_SRB15
145 stat2016_TT_SRB3
146 stat2017_TT_SRB8
147 stat2017_sig_SRB6
148 stat2018_TT_SRB1
149 stat2017_DY_SRB12
150 stat2017_DY_SRB13
−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 +0.13 −0.11
151 stat2017_otherSM_SRB2
152 stat2016_fake_SRB12
153 stat2017_fake_SRB4
154 stat2016_sig_SRB12
155 stat2016_otherSM_SRB10
156 stat2018_sig_SRB10
157 stat2018_TT_SRB13
158 stat2018_sig_SRB13
159 stat2017_sig_SRB12
160 stat2017_TT_SRB12
161 stat2017_fake_SRB14
162 stat2017_TT_SRB14
163 stat2017_DY_SRB8
164 stat2017_TT_SRB6
165 stat2017_DY_SRB15
166 stat2016_TT_SRB7
167 syst2017_bTaggingSF
168 stat2016_DY_SRB12
169 stat2016_fake_SRB4
170 stat2016_TT_SRB4
171 stat2017_TT_SRB4
172 syst2016_bTaggingSF
173 stat2017_sig_SRB1
174 stat2018_otherSM_SRB15
175 stat2018_TT_SRB7
176 stat2017_DY_SRB1
177 stat2018_TT_SRB3
178 stat2018_DY_SRB7
179 stat2017_DY_SRB6
180 stat2016_DY_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 +0.13 −0.11
181 stat2017_fake_SRB15
182 stat2018_otherSM_SRB5
183 stat2018_DY_SRB10
184 stat2018_otherSM_SRB3
185 stat2016_otherSM_SRB2
186 stat2018_TT_SRB5
187 stat2016_fake_SRB9
188 stat2018_DY_SRB14
189 stat2018_sig_SRB11
190 stat2016_DY_SRB13
191 stat2017_TT_SRB3
192 stat2017_TT_SRB1
193 stat2016_DY_SRB15
194 stat2017_otherSM_SRB10
195 stat2018_otherSM_SRB4
196 stat2018_TT_SRB12
197 stat2016_TT_SRB10
198 stat2017_TT_SRB13
199 stat2017_DY_SRB10
200 stat2018_TT_SRB4
201 stat2017_otherSM_SRB9
202 stat2017_otherSM_SRB4
203 stat2016_DY_SRB10
204 stat2016_DY_SRB4
205 stat2016_DY_SRB11
206 stat2018_DY_SRB11
207 stat2016_TT_SRB13
208 syst2016_ZpTreweight
209 syst2017_pileupReweight
210 stat2016_DY_SRB7
×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 +0.13 −0.11
211 stat2018_fake_SRB10
212 stat2016_TT_SRB14
213 stat2017_DY_SRB3
214 stat2016_otherSM_SRB4
215 stat2016_otherSM_SRB7
216 stat2018_otherSM_SRB1
217 stat2018_otherSM_SRB7
218 stat2018_TT_SRB9
219 stat2017_otherSM_SRB13
220 stat2016_DY_SRB3
221 stat2017_otherSM_SRB3
222 syst2017_ZpTreweight
223 stat2017_DY_SRB4
224 stat2016_DY_SRB9
225 stat2018_otherSM_SRB12
226 stat2018_TT_SRB8
227 stat2016_TT_SRB12
228 stat2017_otherSM_SRB6
229 stat2018_TT_SRB11
230 stat2016_otherSM_SRB6
231 stat2016_otherSM_SRB8
232 stat2017_otherSM_SRB12
233 stat2017_otherSM_SRB8
234 stat2016_otherSM_SRB1
235 syst2018_ZpTreweight
236 stat2016_fake_SRB15
237 stat2018_otherSM_SRB11
238 stat2016_otherSM_SRB14
239 stat2016_otherSM_SRB13
240 stat2018_otherSM_SRB9
−2 −1 0 1 2
−0.1 −0.05 0 0.05 0.1
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.13 −0.11
241 stat2017_otherSM_SRB11
242 stat2016_otherSM_SRB3
243 stat2017_otherSM_SRB7
244 stat2016_otherSM_SRB9
245 stat2016_otherSM_SRB12
246 stat2018_TT_SRB10
247 stat2016_DY_SRB6
248 stat2016_otherSM_SRB11
249 stat2018_TT_SRB14
250 stat2018_otherSM_SRB13
251 stat2018_otherSM_SRB10
252 stat2016_TT_SRB9
253 stat2018_otherSM_SRB8
254 stat2017_TT_SRB10
255 stat2018_TT_SRB15
256 stat2017_otherSM_SRB1
257 stat2018_otherSM_SRB14
258 stat2017_otherSM_SRB15
259 stat2018_fake_SRB14
260 stat2016_otherSM_SRB15
261 stat2017_otherSM_SRB14
262 stat2017_DY_SRB7
×10
−2 −1 0 1 2
−0.02 0 0.02
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂