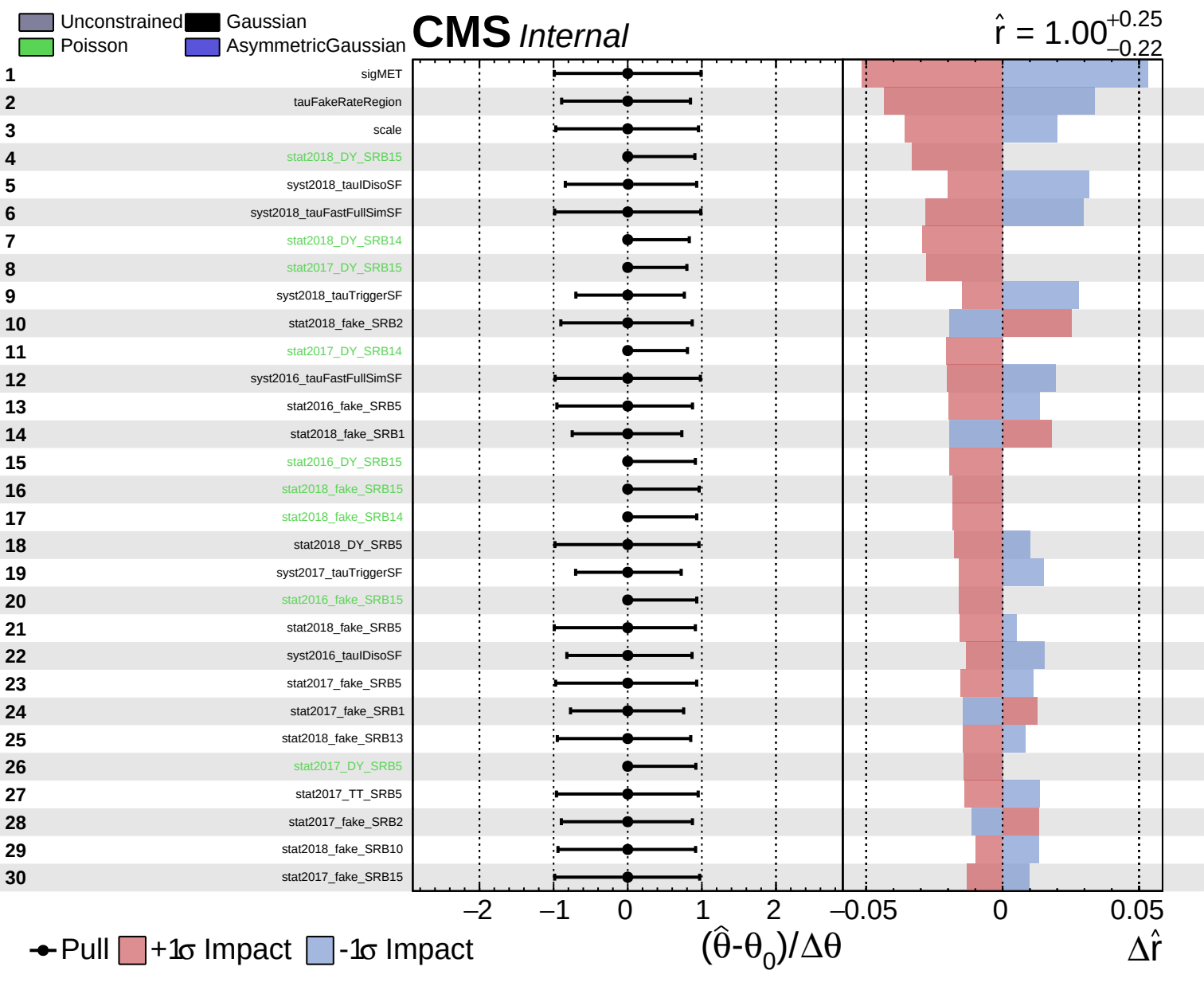
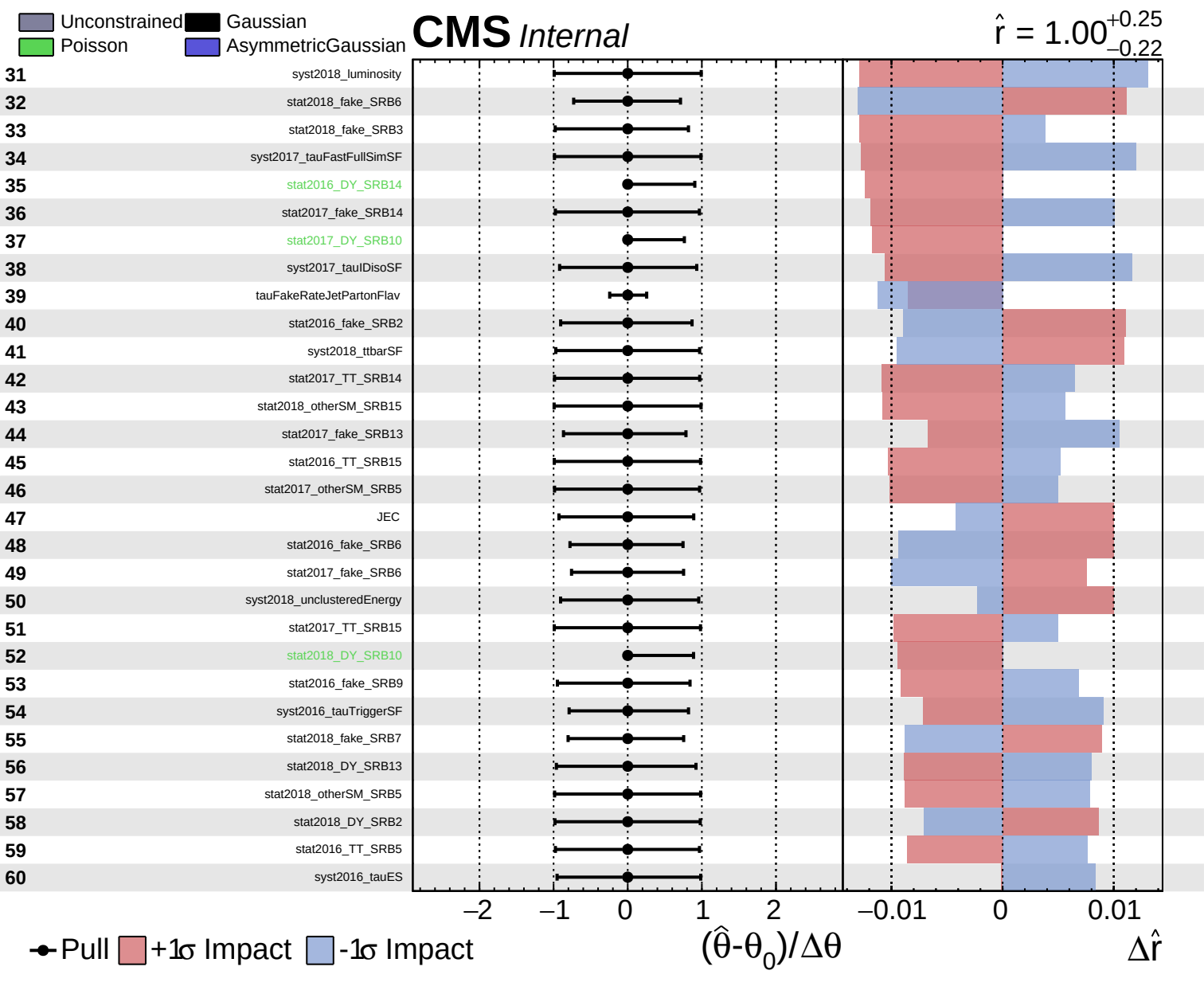
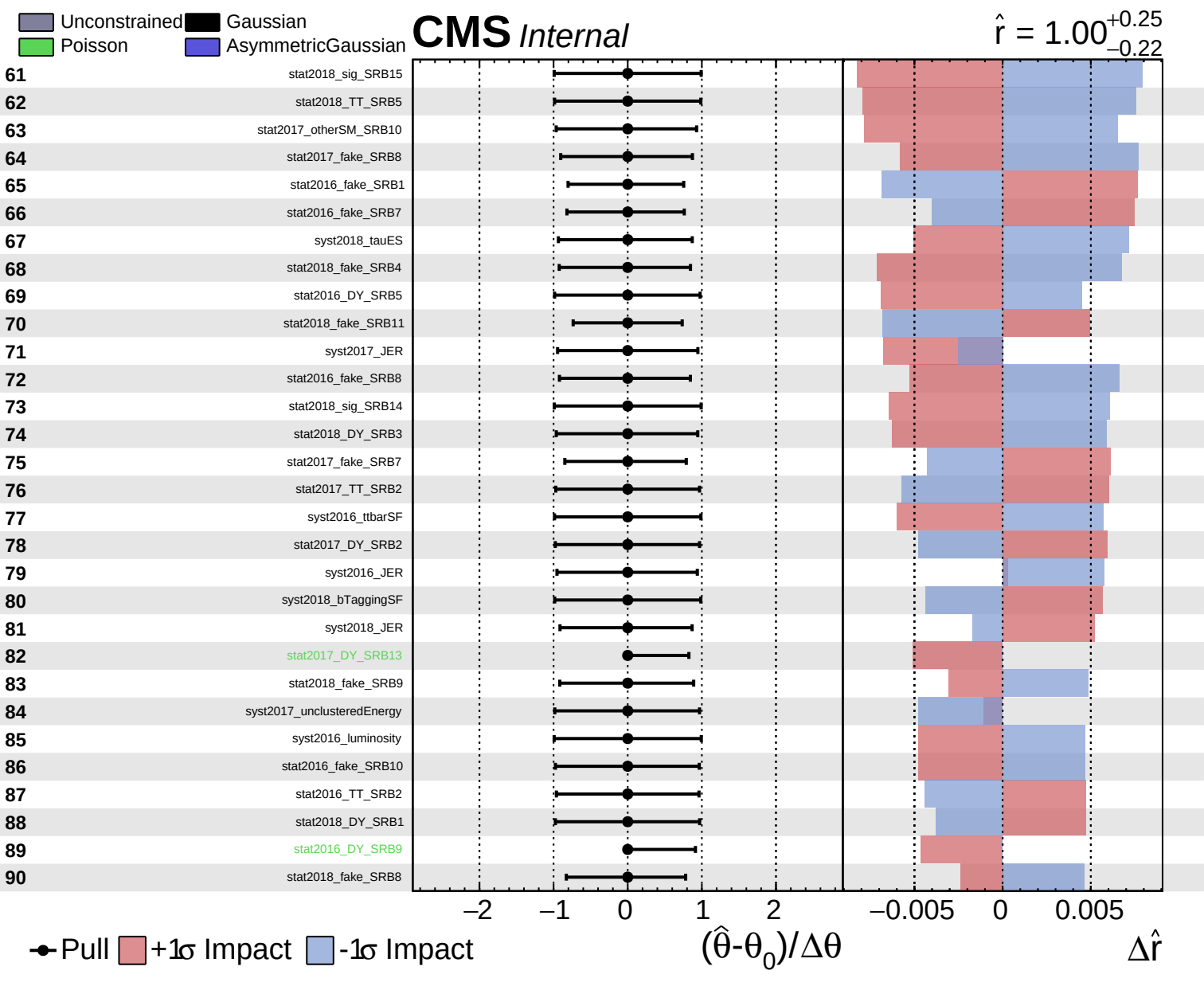
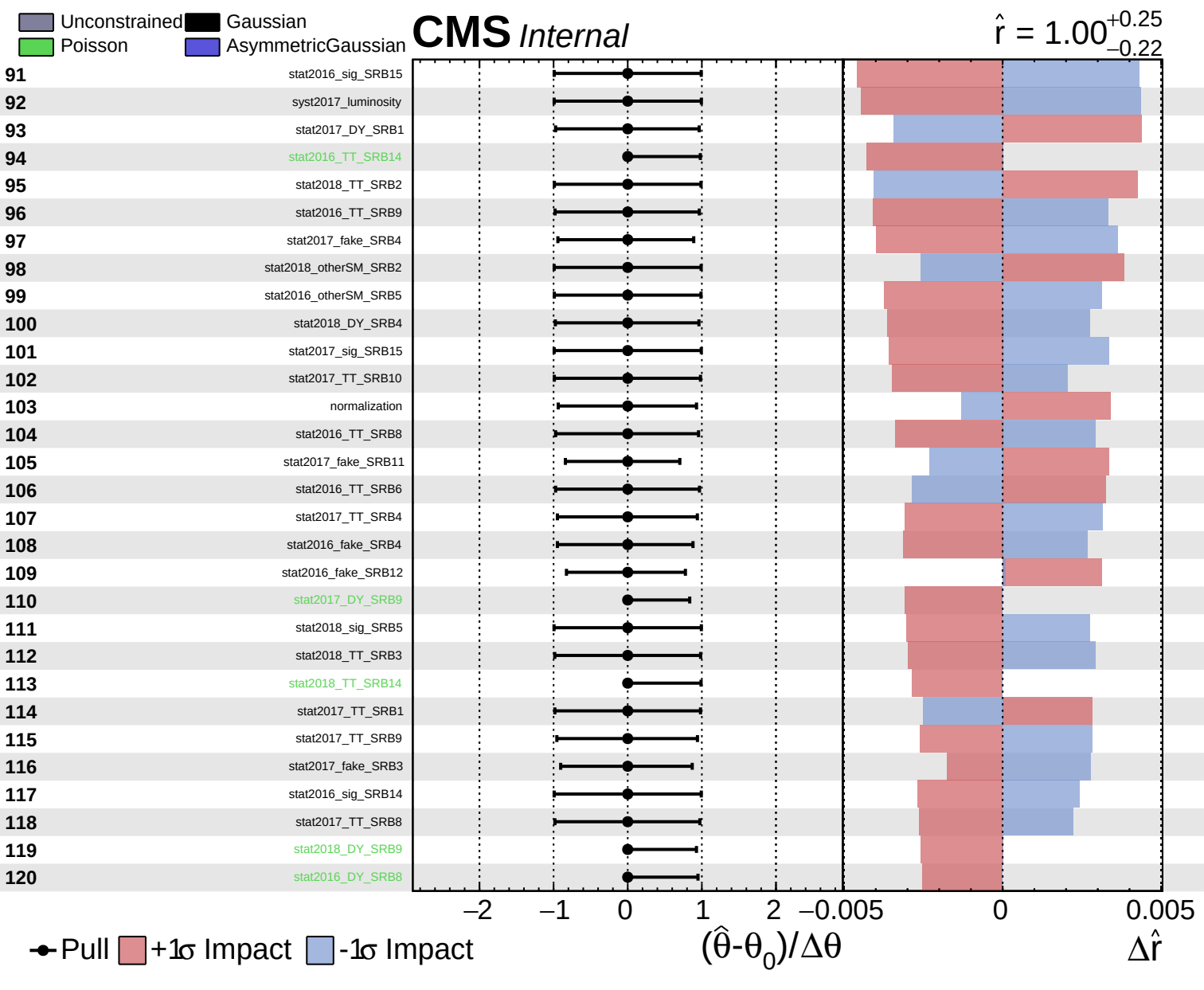
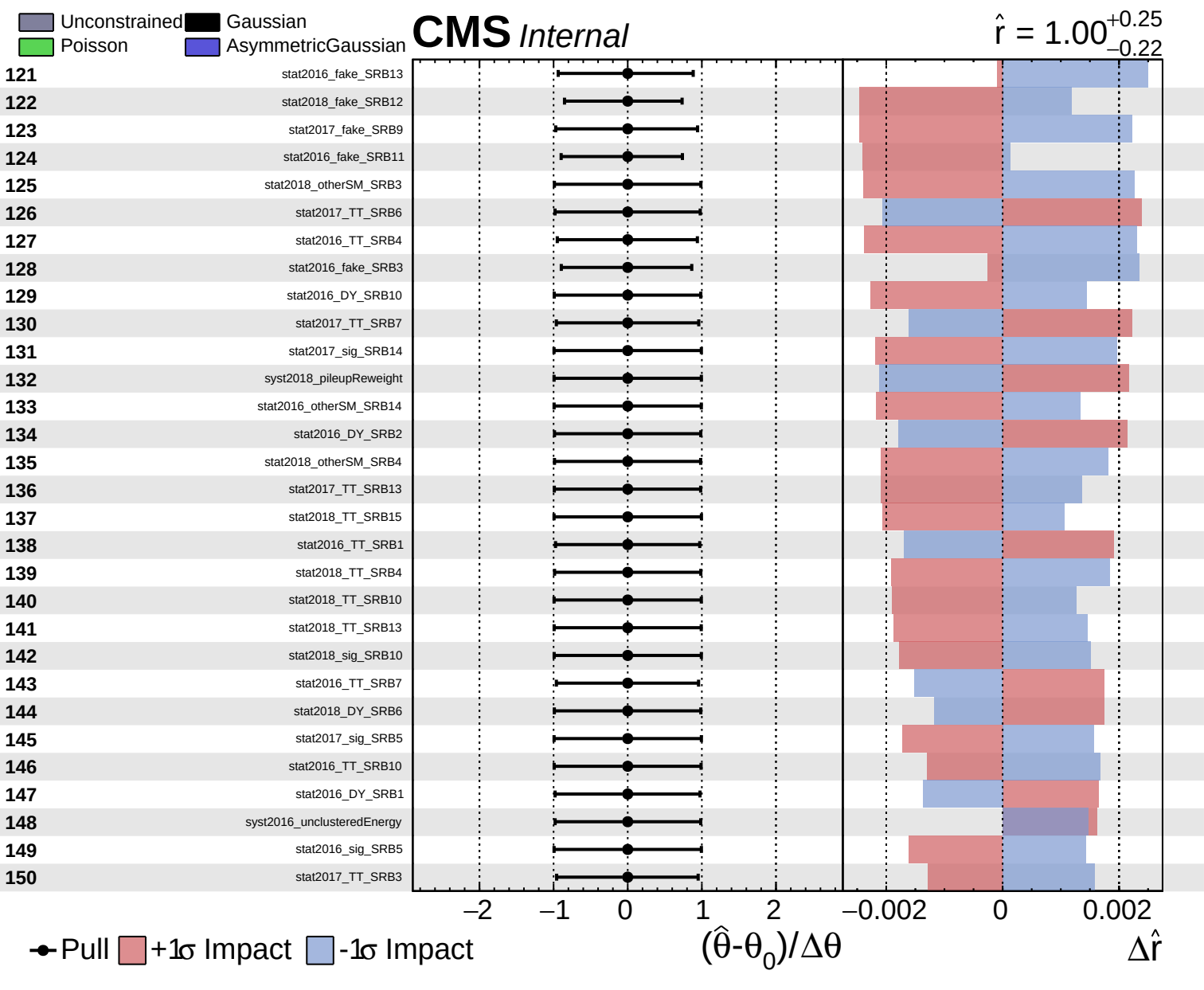
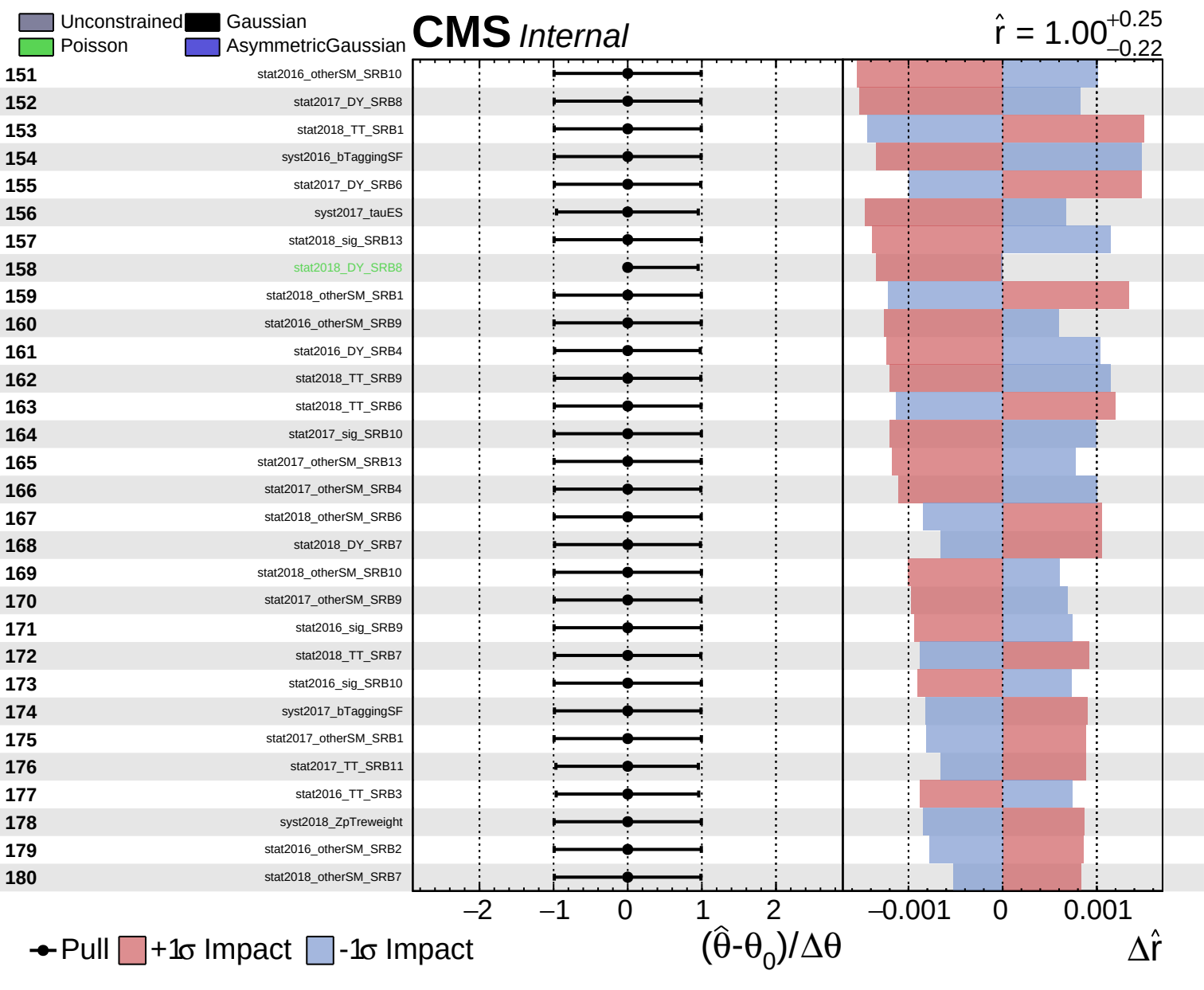

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.25 −0.22
1 sigMET
2 tauFakeRateRegion
3 scale
4 stat2018_DY_SRB15
5 syst2018_tauIDisoSF
6 syst2018_tauFastFullSimSF
7 stat2018_DY_SRB14
8 stat2017_DY_SRB15
9 syst2018_tauTriggerSF
10 stat2018_fake_SRB2
11 stat2017_DY_SRB14
12 syst2016_tauFastFullSimSF
13 stat2016_fake_SRB5
14 stat2018_fake_SRB1
15 stat2016_DY_SRB15
16 stat2018_fake_SRB15
17 stat2018_fake_SRB14
18 stat2018_DY_SRB5
19 syst2017_tauTriggerSF
20 stat2016_fake_SRB15
21 stat2018_fake_SRB5
22 syst2016_tauIDisoSF
23 stat2017_fake_SRB5
24 stat2017_fake_SRB1
25 stat2018_fake_SRB13
26 stat2017_DY_SRB5
27 stat2017_TT_SRB5
28 stat2017_fake_SRB2
29 stat2018_fake_SRB10
30 stat2017_fake_SRB15
−2 −1 0 1 2
−0.05 0 0.05
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂

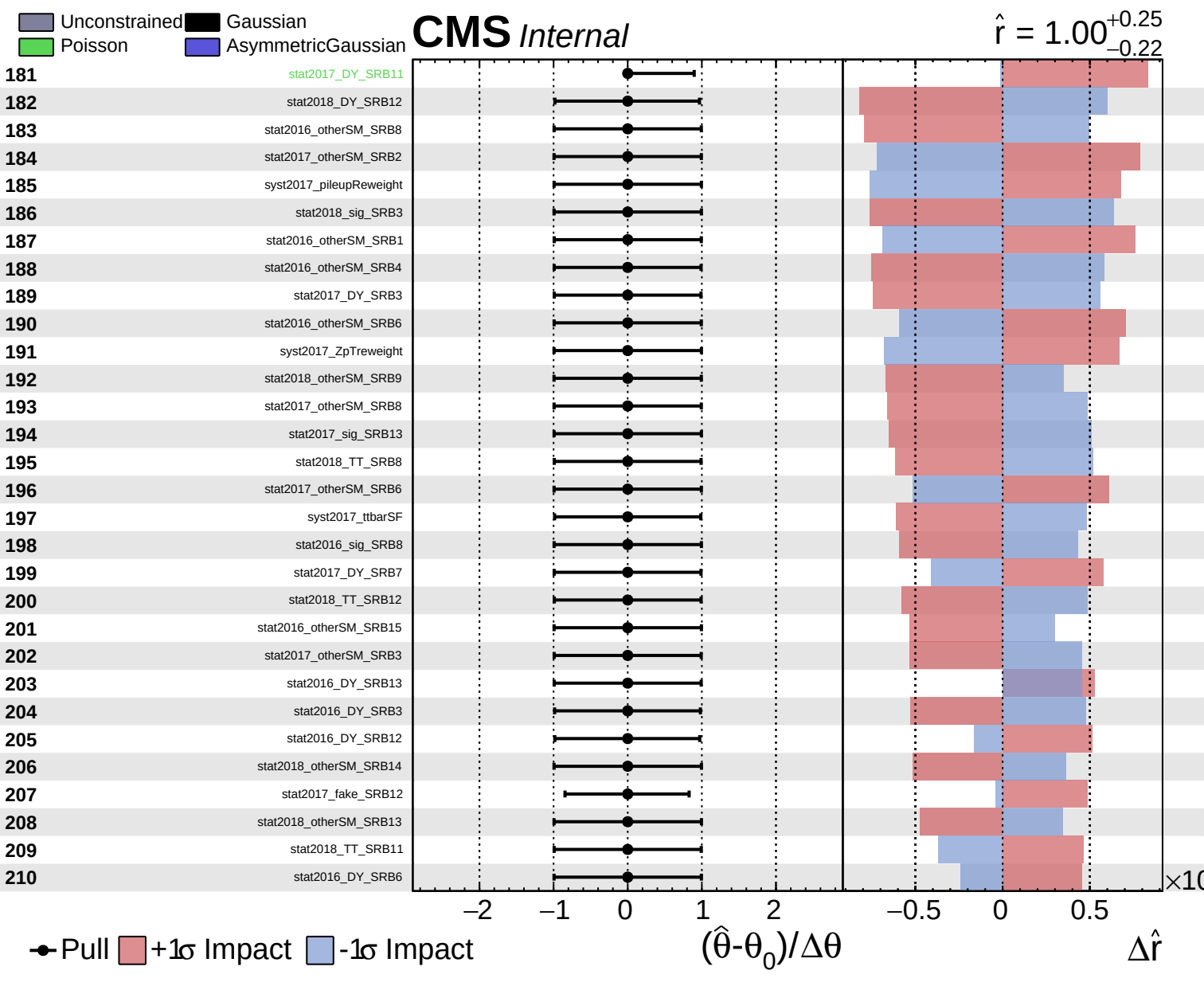

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.25 −0.22
31 syst2018_luminosity
32 stat2018_fake_SRB6
33 stat2018_fake_SRB3
34 syst2017_tauFastFullSimSF
35 stat2016_DY_SRB14
36 stat2017_fake_SRB14
37 stat2017_DY_SRB10
38 syst2017_tauIDisoSF
39 tauFakeRateJetPartonFlav
40 stat2016_fake_SRB2
41 syst2018_ttbarSF
42 stat2017_TT_SRB14
43 stat2018_otherSM_SRB15
44 stat2017_fake_SRB13
45 stat2016_TT_SRB15
46 stat2017_otherSM_SRB5
47 JEC
48 stat2016_fake_SRB6
49 stat2017_fake_SRB6
50 syst2018_unclusteredEnergy
51 stat2017_TT_SRB15
52 stat2018_DY_SRB10
53 stat2016_fake_SRB9
54 syst2016_tauTriggerSF
55 stat2018_fake_SRB7
56 stat2018_DY_SRB13
57 stat2018_otherSM_SRB5
58 stat2018_DY_SRB2
59 stat2016_TT_SRB5
60 syst2016_tauES
−2 −1 0 1 2
−0.01 0 0.01
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂

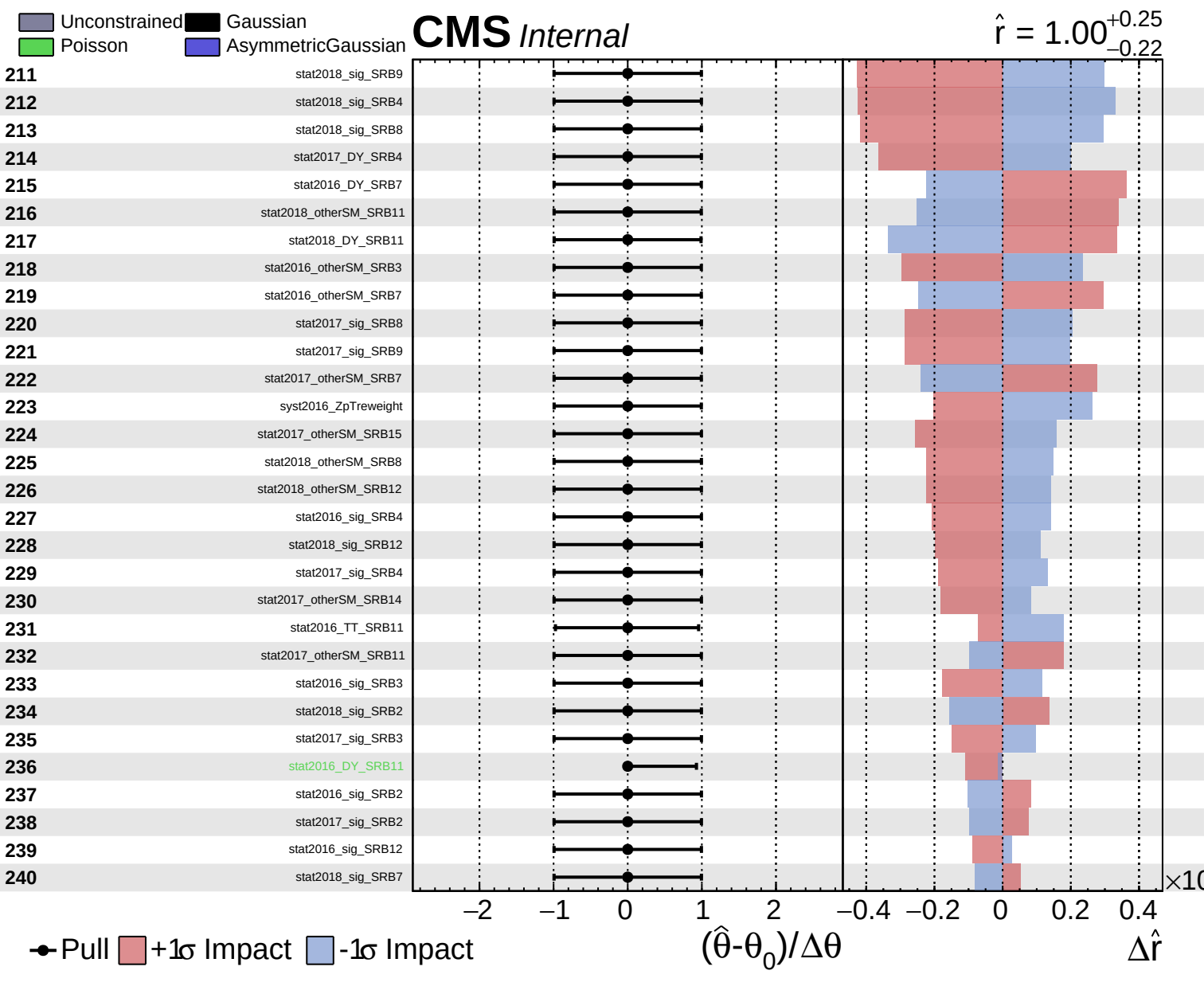

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.25 −0.22
61 stat2018_sig_SRB15
62 stat2018_TT_SRB5
63 stat2017_otherSM_SRB10
64 stat2017_fake_SRB8
65 stat2016_fake_SRB1
66 stat2016_fake_SRB7
67 syst2018_tauES
68 stat2018_fake_SRB4
69 stat2016_DY_SRB5
70 stat2018_fake_SRB11
71 syst2017_JER
72 stat2016_fake_SRB8
73 stat2018_sig_SRB14
74 stat2018_DY_SRB3
75 stat2017_fake_SRB7
76 stat2017_TT_SRB2
77 syst2016_ttbarSF
78 stat2017_DY_SRB2
79 syst2016_JER
80 syst2018_bTaggingSF
81 syst2018_JER
82 stat2017_DY_SRB13
83 stat2018_fake_SRB9
84 syst2017_unclusteredEnergy
85 syst2016_luminosity
86 stat2016_fake_SRB10
87 stat2016_TT_SRB2
88 stat2018_DY_SRB1
89 stat2016_DY_SRB9
90 stat2018_fake_SRB8
−2 −1 0 1 2
−0.005 0 0.005
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

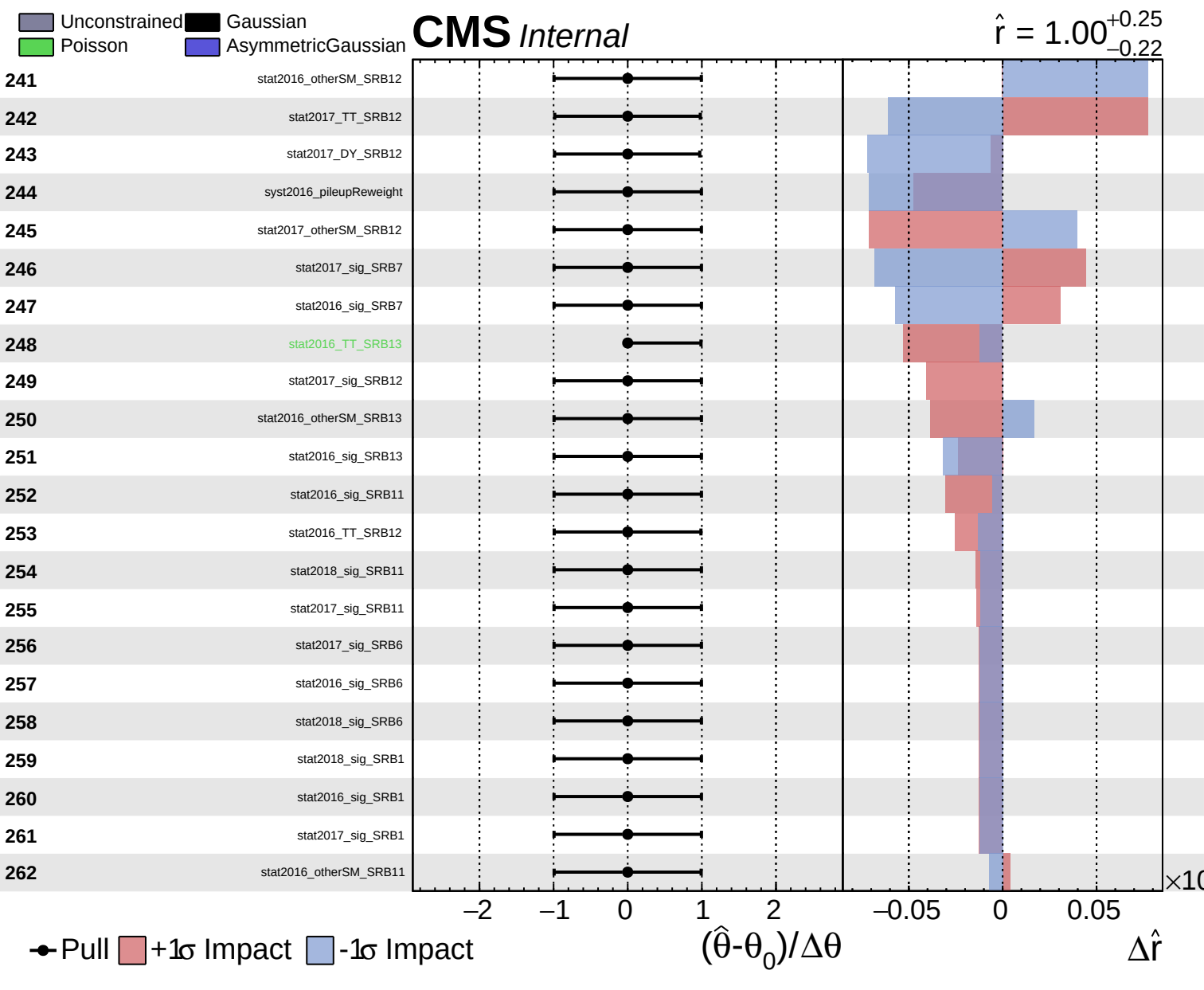

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.25 −0.22
91 stat2016_sig_SRB15
92 syst2017_luminosity
93 stat2017_DY_SRB1
94 stat2016_TT_SRB14
95 stat2018_TT_SRB2
96 stat2016_TT_SRB9
97 stat2017_fake_SRB4
98 stat2018_otherSM_SRB2
99 stat2016_otherSM_SRB5
100 stat2018_DY_SRB4
101 stat2017_sig_SRB15
102 stat2017_TT_SRB10
103 normalization
104 stat2016_TT_SRB8
105 stat2017_fake_SRB11
106 stat2016_TT_SRB6
107 stat2017_TT_SRB4
108 stat2016_fake_SRB4
109 stat2016_fake_SRB12
110 stat2017_DY_SRB9
111 stat2018_sig_SRB5
112 stat2018_TT_SRB3
113 stat2018_TT_SRB14
114 stat2017_TT_SRB1
115 stat2017_TT_SRB9
116 stat2017_fake_SRB3
117 stat2016_sig_SRB14
118 stat2017_TT_SRB8
119 stat2018_DY_SRB9
120 stat2016_DY_SRB8
−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 +0.25 −0.22
121 stat2016_fake_SRB13
122 stat2018_fake_SRB12
123 stat2017_fake_SRB9
124 stat2016_fake_SRB11
125 stat2018_otherSM_SRB3
126 stat2017_TT_SRB6
127 stat2016_TT_SRB4
128 stat2016_fake_SRB3
129 stat2016_DY_SRB10
130 stat2017_TT_SRB7
131 stat2017_sig_SRB14
132 syst2018_pileupReweight
133 stat2016_otherSM_SRB14
134 stat2016_DY_SRB2
135 stat2018_otherSM_SRB4
136 stat2017_TT_SRB13
137 stat2018_TT_SRB15
138 stat2016_TT_SRB1
139 stat2018_TT_SRB4
140 stat2018_TT_SRB10
141 stat2018_TT_SRB13
142 stat2018_sig_SRB10
143 stat2016_TT_SRB7
144 stat2018_DY_SRB6
145 stat2017_sig_SRB5
146 stat2016_TT_SRB10
147 stat2016_DY_SRB1
148 syst2016_unclusteredEnergy
149 stat2016_sig_SRB5
150 stat2017_TT_SRB3
−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 +0.25 −0.22
151 stat2016_otherSM_SRB10
152 stat2017_DY_SRB8
153 stat2018_TT_SRB1
154 syst2016_bTaggingSF
155 stat2017_DY_SRB6
156 syst2017_tauES
157 stat2018_sig_SRB13
158 stat2018_DY_SRB8
159 stat2018_otherSM_SRB1
160 stat2016_otherSM_SRB9
161 stat2016_DY_SRB4
162 stat2018_TT_SRB9
163 stat2018_TT_SRB6
164 stat2017_sig_SRB10
165 stat2017_otherSM_SRB13
166 stat2017_otherSM_SRB4
167 stat2018_otherSM_SRB6
168 stat2018_DY_SRB7
169 stat2018_otherSM_SRB10
170 stat2017_otherSM_SRB9
171 stat2016_sig_SRB9
172 stat2018_TT_SRB7
173 stat2016_sig_SRB10
174 syst2017_bTaggingSF
175 stat2017_otherSM_SRB1
176 stat2017_TT_SRB11
177 stat2016_TT_SRB3
178 syst2018_ZpTreweight
179 stat2016_otherSM_SRB2
180 stat2018_otherSM_SRB7
−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 +0.25 −0.22
181 stat2017_DY_SRB11
182 stat2018_DY_SRB12
183 stat2016_otherSM_SRB8
184 stat2017_otherSM_SRB2
185 syst2017_pileupReweight
186 stat2018_sig_SRB3
187 stat2016_otherSM_SRB1
188 stat2016_otherSM_SRB4
189 stat2017_DY_SRB3
190 stat2016_otherSM_SRB6
191 syst2017_ZpTreweight
192 stat2018_otherSM_SRB9
193 stat2017_otherSM_SRB8
194 stat2017_sig_SRB13
195 stat2018_TT_SRB8
196 stat2017_otherSM_SRB6
197 syst2017_ttbarSF
198 stat2016_sig_SRB8
199 stat2017_DY_SRB7
200 stat2018_TT_SRB12
201 stat2016_otherSM_SRB15
202 stat2017_otherSM_SRB3
203 stat2016_DY_SRB13
204 stat2016_DY_SRB3
205 stat2016_DY_SRB12
206 stat2018_otherSM_SRB14
207 stat2017_fake_SRB12
208 stat2018_otherSM_SRB13
209 stat2018_TT_SRB11
210 stat2016_DY_SRB6
×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 +0.25 −0.22
211 stat2018_sig_SRB9
212 stat2018_sig_SRB4
213 stat2018_sig_SRB8
214 stat2017_DY_SRB4
215 stat2016_DY_SRB7
216 stat2018_otherSM_SRB11
217 stat2018_DY_SRB11
218 stat2016_otherSM_SRB3
219 stat2016_otherSM_SRB7
220 stat2017_sig_SRB8
221 stat2017_sig_SRB9
222 stat2017_otherSM_SRB7
223 syst2016_ZpTreweight
224 stat2017_otherSM_SRB15
225 stat2018_otherSM_SRB8
226 stat2018_otherSM_SRB12
227 stat2016_sig_SRB4
228 stat2018_sig_SRB12
229 stat2017_sig_SRB4
230 stat2017_otherSM_SRB14
231 stat2016_TT_SRB11
232 stat2017_otherSM_SRB11
233 stat2016_sig_SRB3
234 stat2018_sig_SRB2
235 stat2017_sig_SRB3
236 stat2016_DY_SRB11
237 stat2016_sig_SRB2
238 stat2017_sig_SRB2
239 stat2016_sig_SRB12
240 stat2018_sig_SRB7
−2 −1 0 1 2
−0.4 −0.2 0 0.2 0.4
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.25 −0.22
241 stat2016_otherSM_SRB12
242 stat2017_TT_SRB12
243 stat2017_DY_SRB12
244 syst2016_pileupReweight
245 stat2017_otherSM_SRB12
246 stat2017_sig_SRB7
247 stat2016_sig_SRB7
248 stat2016_TT_SRB13
249 stat2017_sig_SRB12
250 stat2016_otherSM_SRB13
251 stat2016_sig_SRB13
252 stat2016_sig_SRB11
253 stat2016_TT_SRB12
254 stat2018_sig_SRB11
255 stat2017_sig_SRB11
256 stat2017_sig_SRB6
257 stat2016_sig_SRB6
258 stat2018_sig_SRB6
259 stat2018_sig_SRB1
260 stat2016_sig_SRB1
261 stat2017_sig_SRB1
262 stat2016_otherSM_SRB11
−2 −1 0 1 2
−0.05 0 0.05
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂