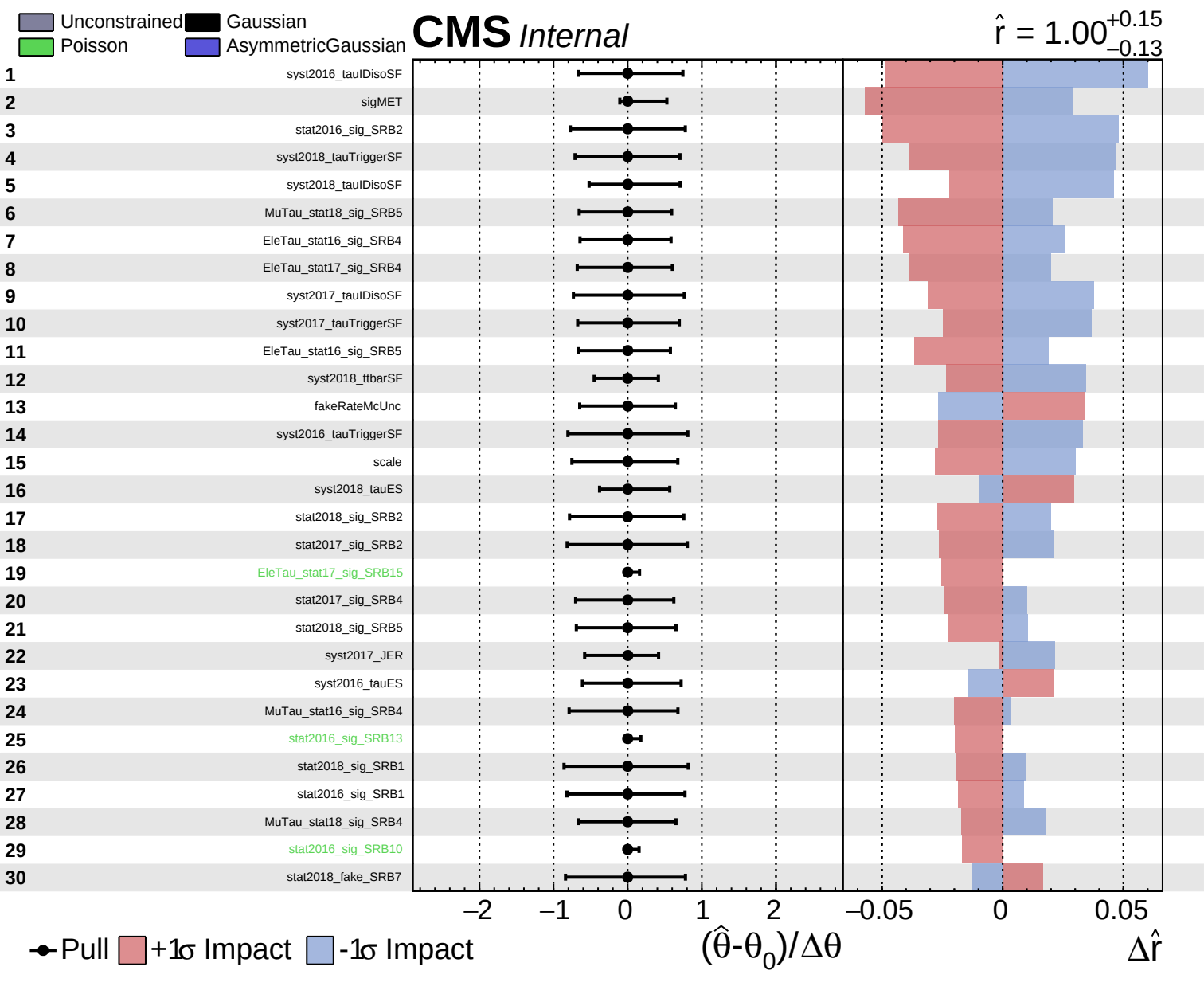
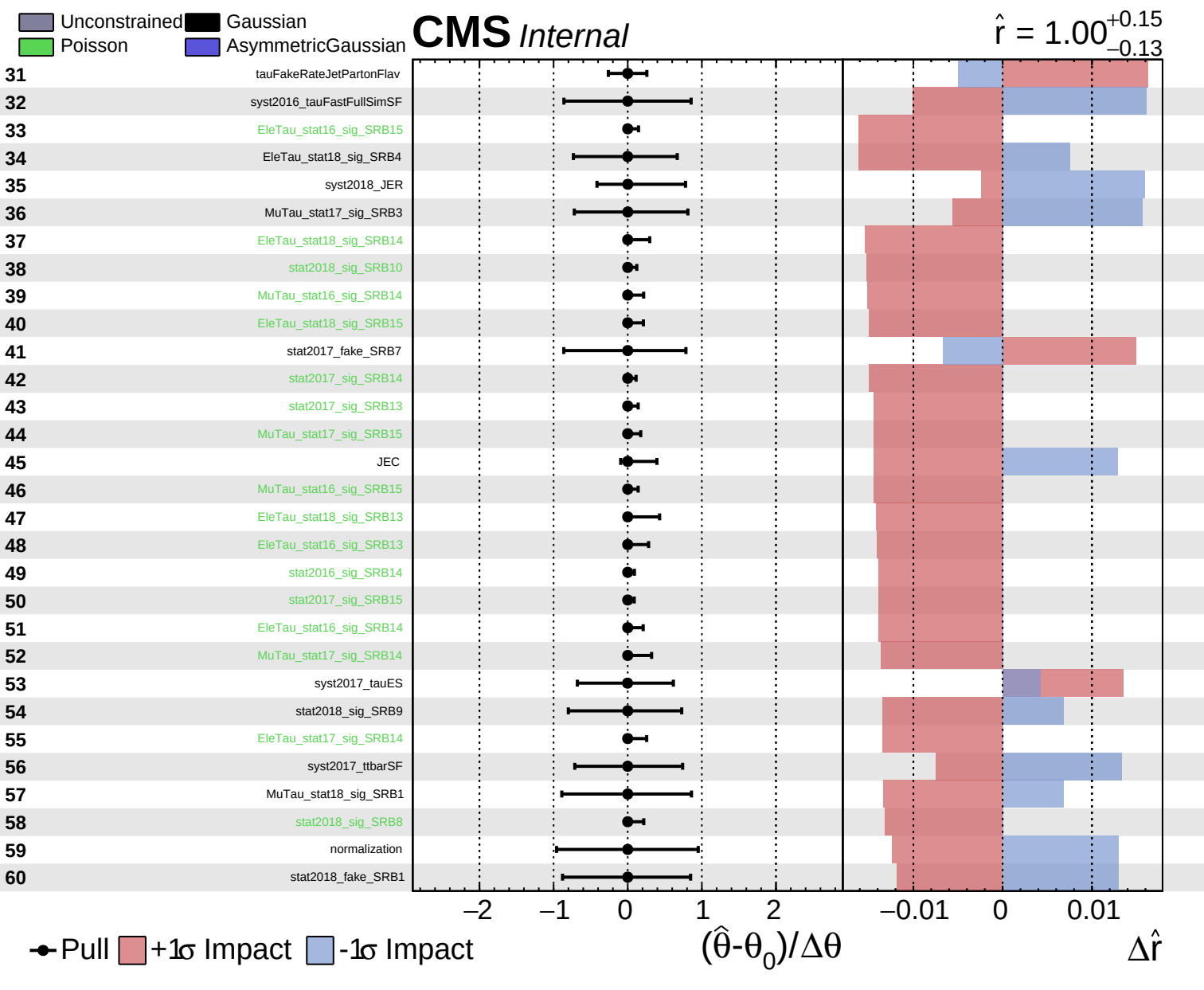
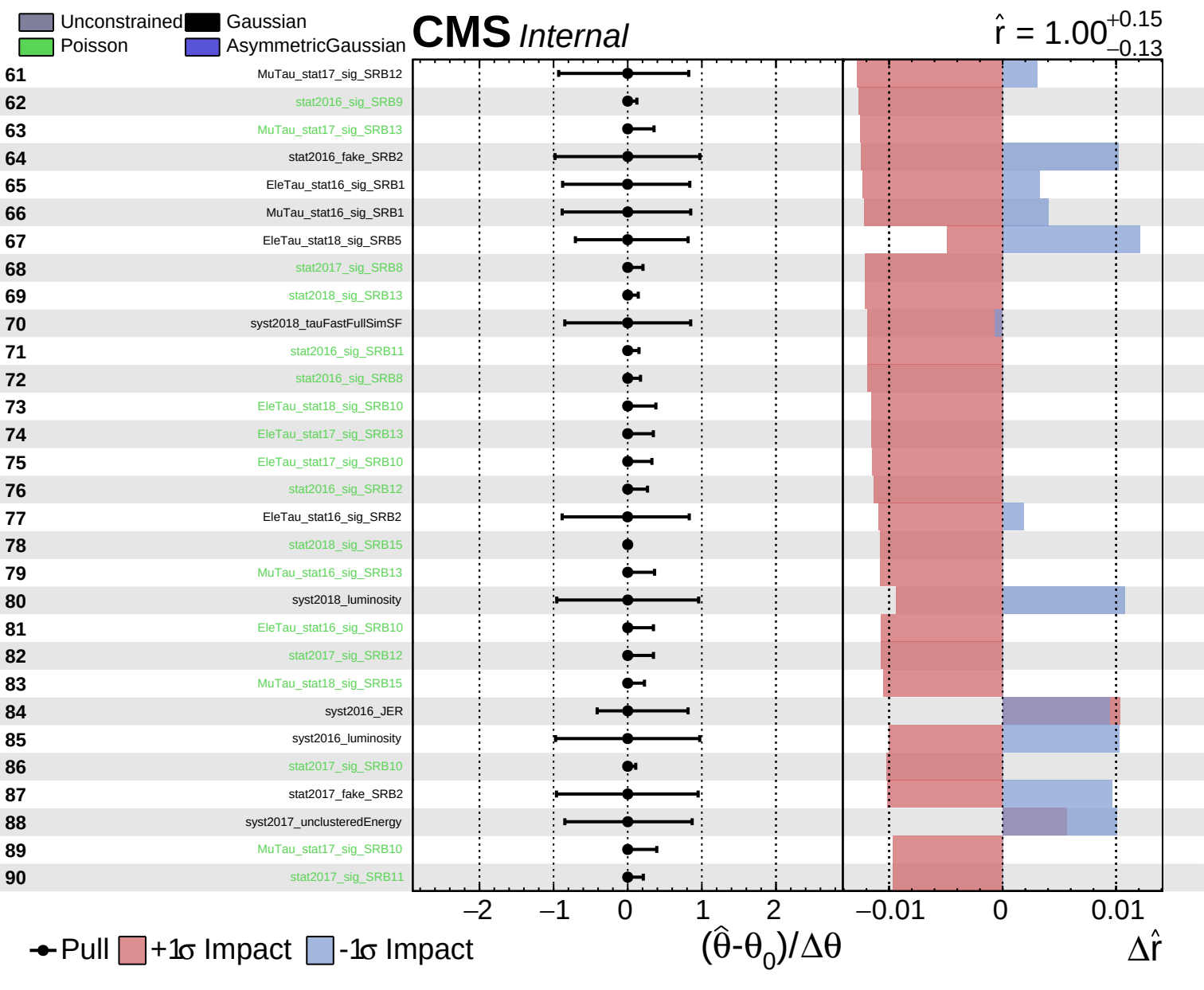
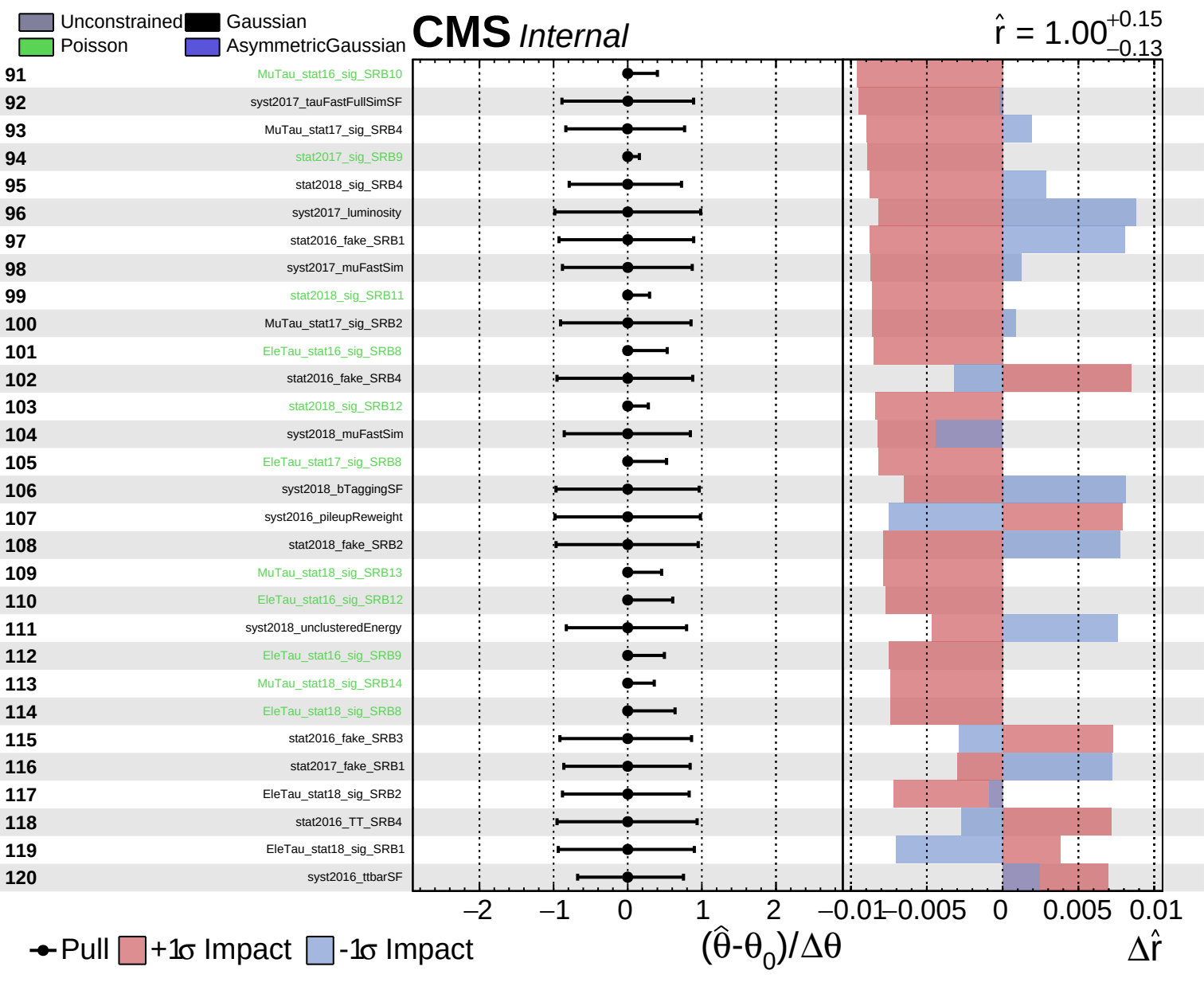
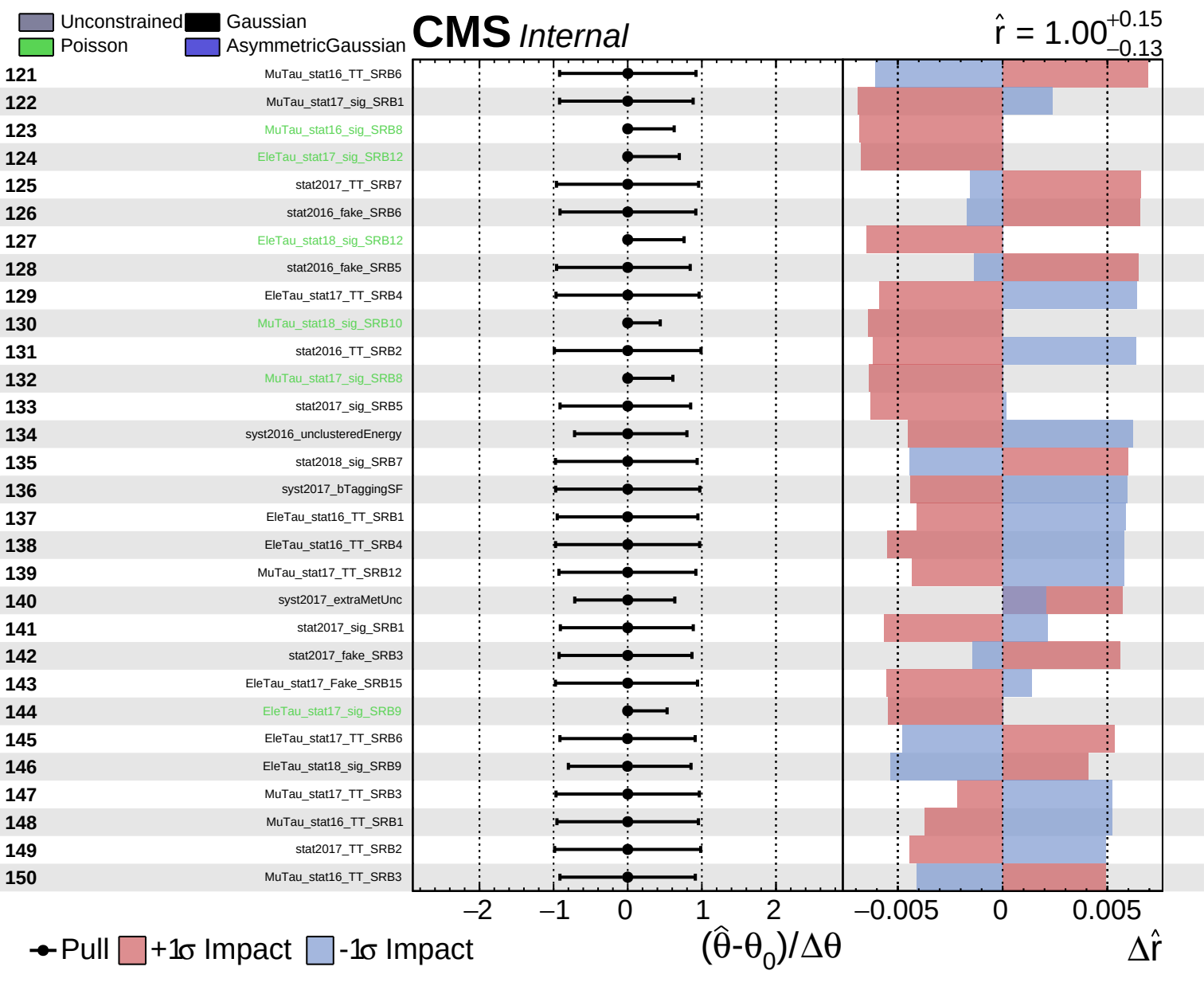
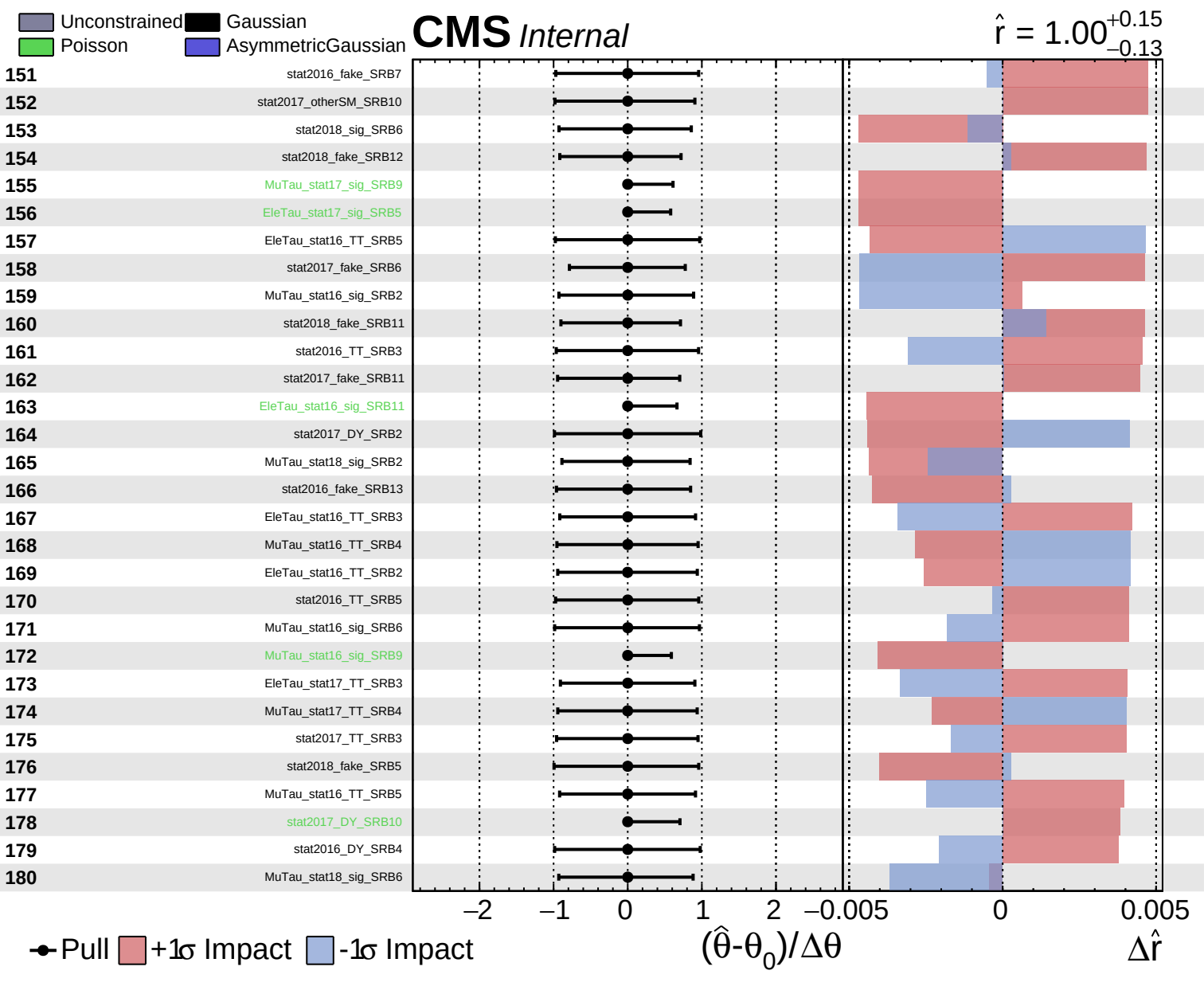

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
1 syst2016_tauIDisoSF
2 sigMET
3 stat2016_sig_SRB2
4 syst2018_tauTriggerSF
5 syst2018_tauIDisoSF
6 MuTau_stat18_sig_SRB5
7 EleTau_stat16_sig_SRB4
8 EleTau_stat17_sig_SRB4
9 syst2017_tauIDisoSF
10 syst2017_tauTriggerSF
11 EleTau_stat16_sig_SRB5
12 syst2018_ttbarSF
13 fakeRateMcUnc
14 syst2016_tauTriggerSF
15 scale
16 syst2018_tauES
17 stat2018_sig_SRB2
18 stat2017_sig_SRB2
19 EleTau_stat17_sig_SRB15
20 stat2017_sig_SRB4
21 stat2018_sig_SRB5
22 syst2017_JER
23 syst2016_tauES
24 MuTau_stat16_sig_SRB4
25 stat2016_sig_SRB13
26 stat2018_sig_SRB1
27 stat2016_sig_SRB1
28 MuTau_stat18_sig_SRB4
29 stat2016_sig_SRB10
30 stat2018_fake_SRB7
−2 −1 0 1 2
−0.05 0 0.05
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

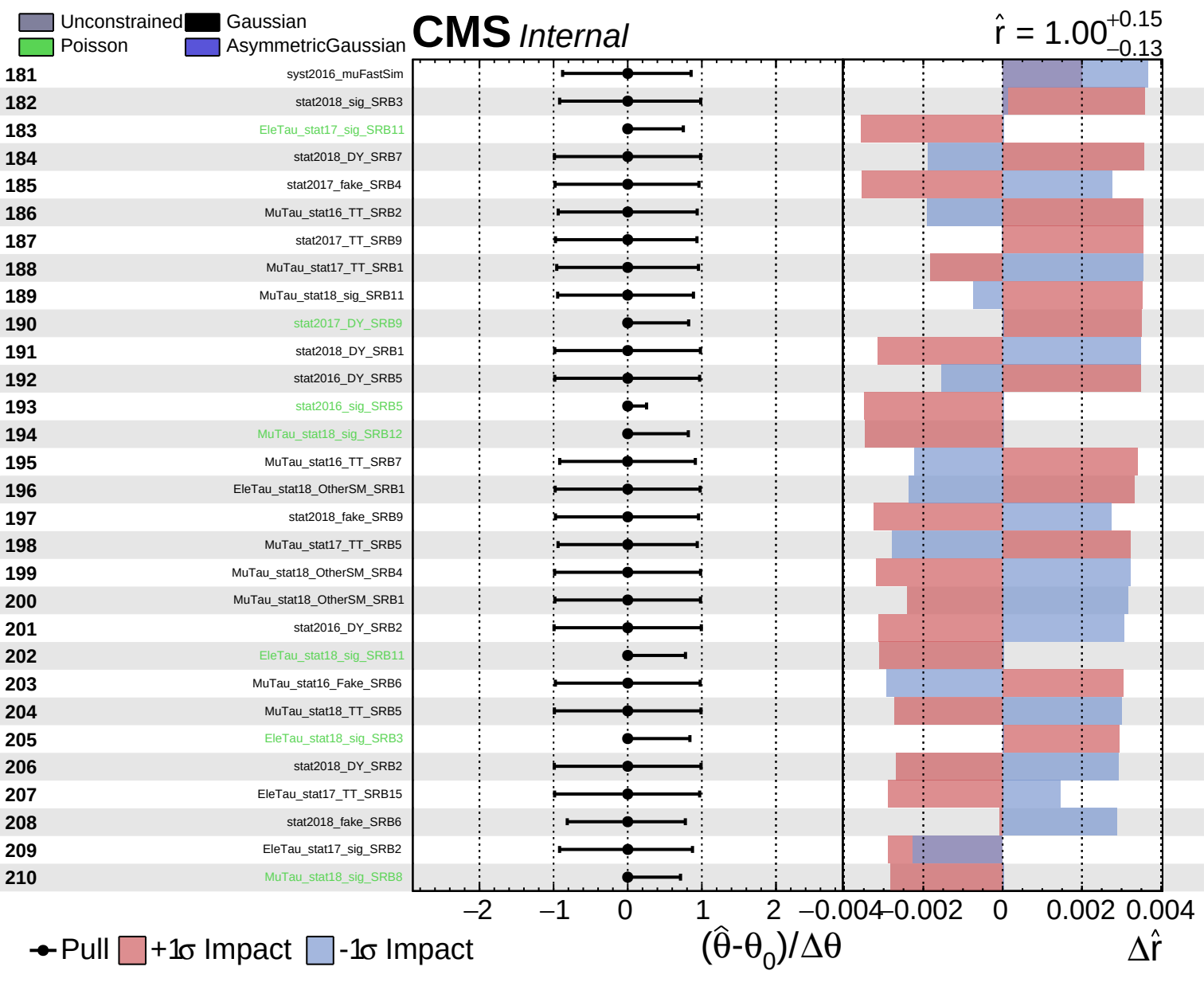

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
31 tauFakeRateJetPartonFlav
32 syst2016_tauFastFullSimSF
33 EleTau_stat16_sig_SRB15
34 EleTau_stat18_sig_SRB4
35 syst2018_JER
36 MuTau_stat17_sig_SRB3
37 EleTau_stat18_sig_SRB14
38 stat2018_sig_SRB10
39 MuTau_stat16_sig_SRB14
40 EleTau_stat18_sig_SRB15
41 stat2017_fake_SRB7
42 stat2017_sig_SRB14
43 stat2017_sig_SRB13
44 MuTau_stat17_sig_SRB15
45 JEC
46 MuTau_stat16_sig_SRB15
47 EleTau_stat18_sig_SRB13
48 EleTau_stat16_sig_SRB13
49 stat2016_sig_SRB14
50 stat2017_sig_SRB15
51 EleTau_stat16_sig_SRB14
52 MuTau_stat17_sig_SRB14
53 syst2017_tauES
54 stat2018_sig_SRB9
55 EleTau_stat17_sig_SRB14
56 syst2017_ttbarSF
57 MuTau_stat18_sig_SRB1
58 stat2018_sig_SRB8
59 normalization
60 stat2018_fake_SRB1
−2 −1 0 1 2
−0.01 0 0.01
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

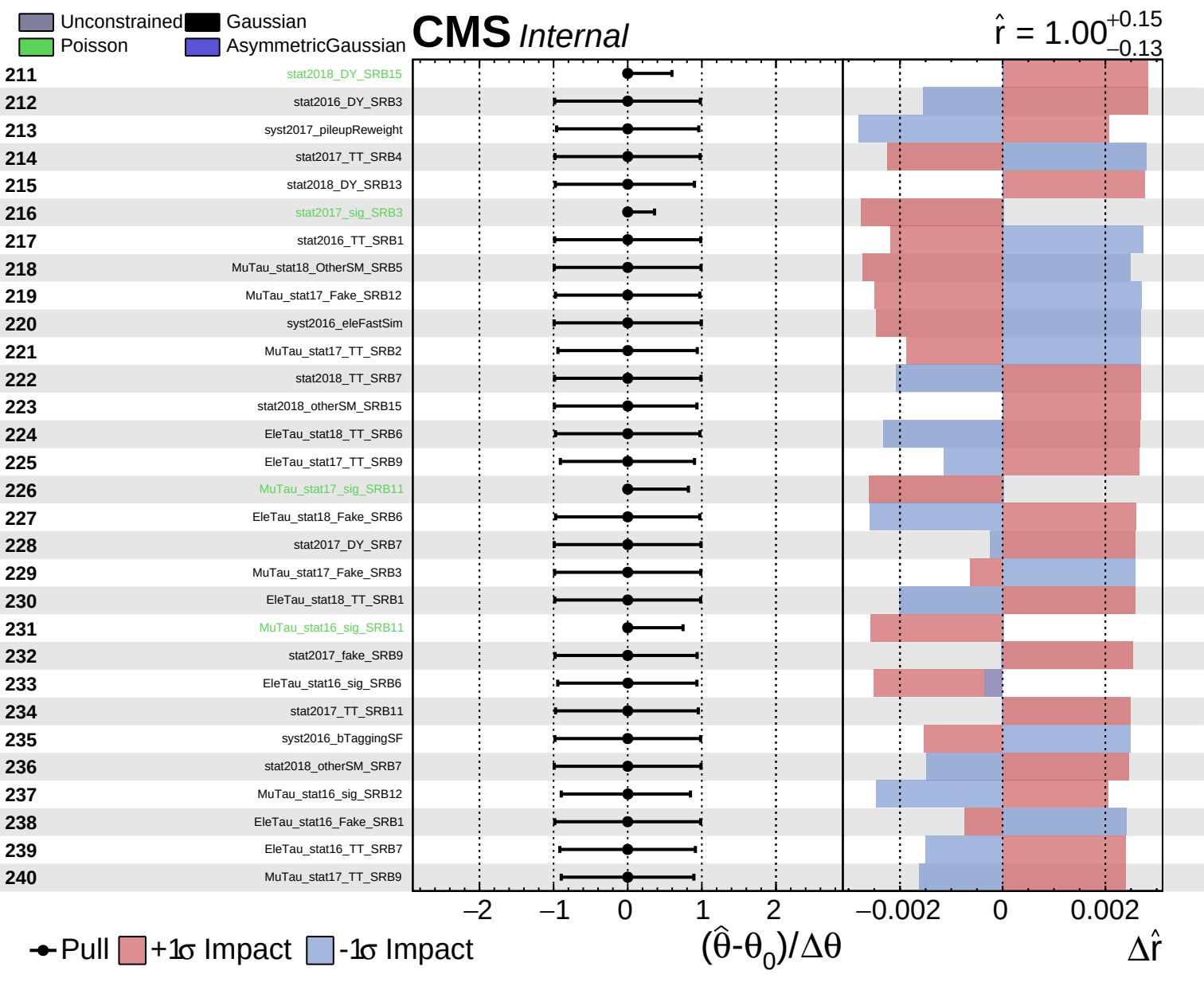

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
61 MuTau_stat17_sig_SRB12
62 stat2016_sig_SRB9
63 MuTau_stat17_sig_SRB13
64 stat2016_fake_SRB2
65 EleTau_stat16_sig_SRB1
66 MuTau_stat16_sig_SRB1
67 EleTau_stat18_sig_SRB5
68 stat2017_sig_SRB8
69 stat2018_sig_SRB13
70 syst2018_tauFastFullSimSF
71 stat2016_sig_SRB11
72 stat2016_sig_SRB8
73 EleTau_stat18_sig_SRB10
74 EleTau_stat17_sig_SRB13
75 EleTau_stat17_sig_SRB10
76 stat2016_sig_SRB12
77 EleTau_stat16_sig_SRB2
78 stat2018_sig_SRB15
79 MuTau_stat16_sig_SRB13
80 syst2018_luminosity
81 EleTau_stat16_sig_SRB10
82 stat2017_sig_SRB12
83 MuTau_stat18_sig_SRB15
84 syst2016_JER
85 syst2016_luminosity
86 stat2017_sig_SRB10
87 stat2017_fake_SRB2
88 syst2017_unclusteredEnergy
89 MuTau_stat17_sig_SRB10
90 stat2017_sig_SRB11
−2 −1 0 1 2
−0.01 0 0.01
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂

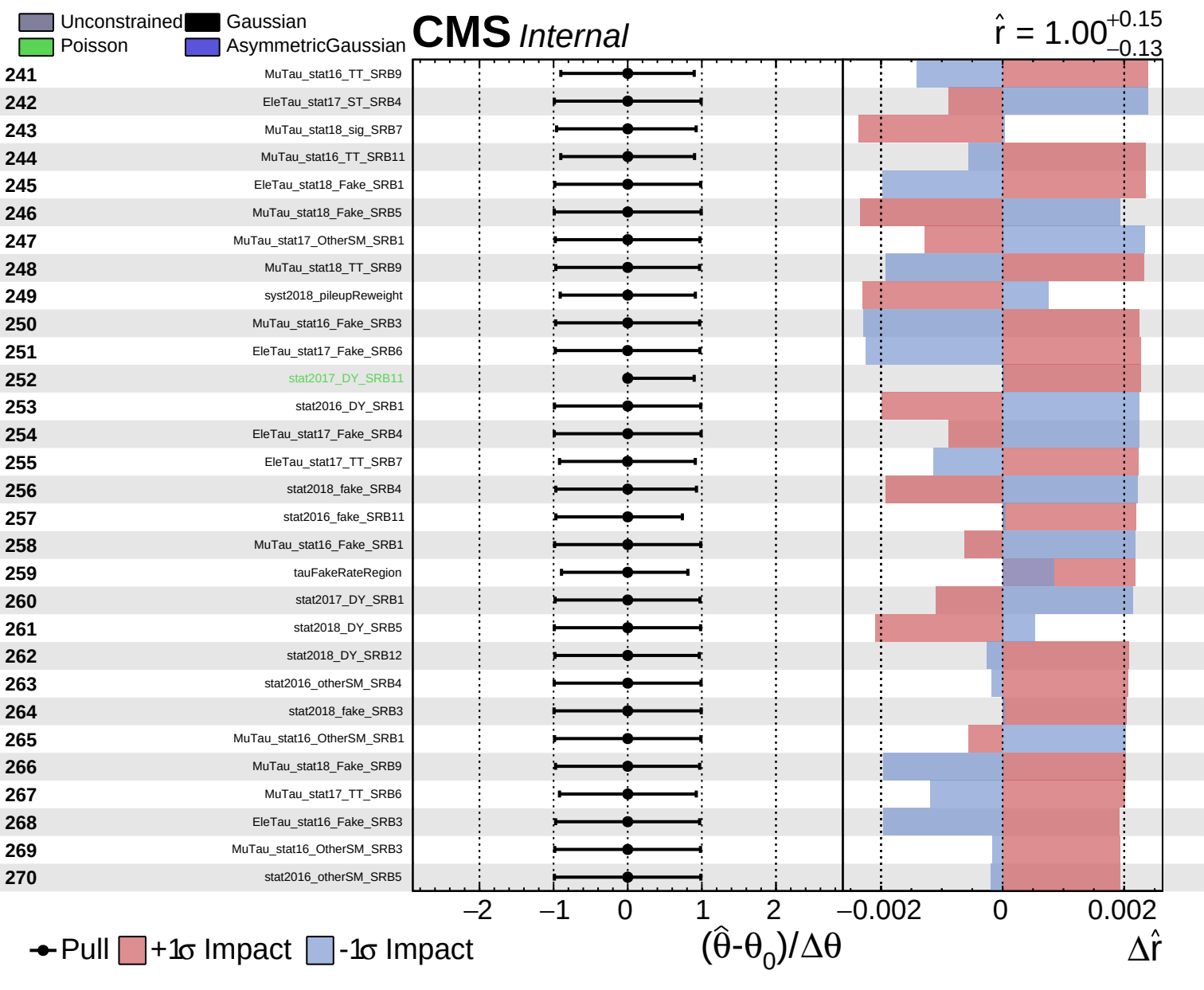

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
91 MuTau_stat16_sig_SRB10
92 syst2017_tauFastFullSimSF
93 MuTau_stat17_sig_SRB4
94 stat2017_sig_SRB9
95 stat2018_sig_SRB4
96 syst2017_luminosity
97 stat2016_fake_SRB1
98 syst2017_muFastSim
99 stat2018_sig_SRB11
100 MuTau_stat17_sig_SRB2
101 EleTau_stat16_sig_SRB8
102 stat2016_fake_SRB4
103 stat2018_sig_SRB12
104 syst2018_muFastSim
105 EleTau_stat17_sig_SRB8
106 syst2018_bTaggingSF
107 syst2016_pileupReweight
108 stat2018_fake_SRB2
109 MuTau_stat18_sig_SRB13
110 EleTau_stat16_sig_SRB12
111 syst2018_unclusteredEnergy
112 EleTau_stat16_sig_SRB9
113 MuTau_stat18_sig_SRB14
114 EleTau_stat18_sig_SRB8
115 stat2016_fake_SRB3
116 stat2017_fake_SRB1
117 EleTau_stat18_sig_SRB2
118 stat2016_TT_SRB4
119 EleTau_stat18_sig_SRB1
120 syst2016_ttbarSF
−2 −1 0 1 2
−0.01 −0.005 0 0.005 0.01
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂

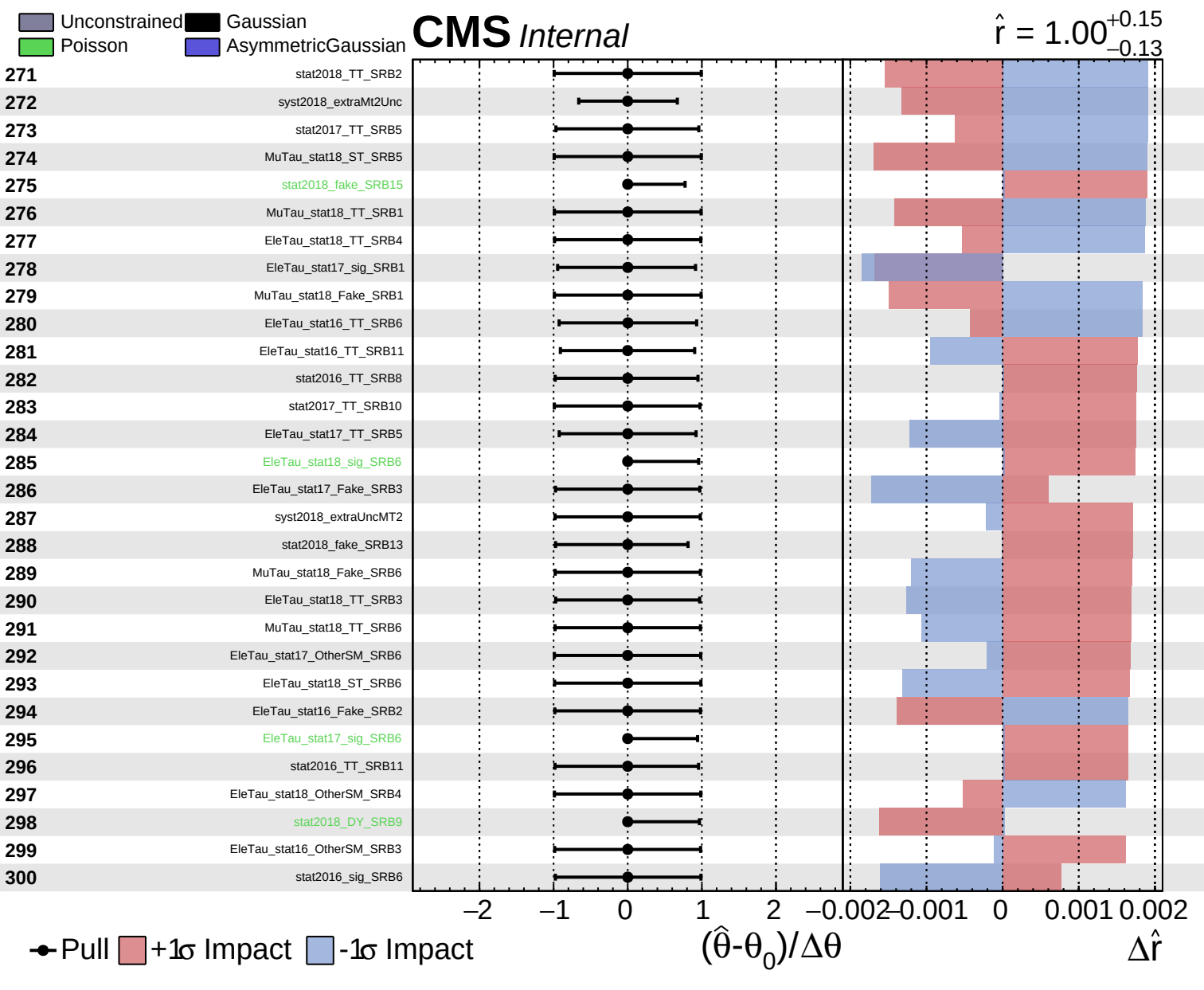

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
121 MuTau_stat16_TT_SRB6
122 MuTau_stat17_sig_SRB1
123 MuTau_stat16_sig_SRB8
124 EleTau_stat17_sig_SRB12
125 stat2017_TT_SRB7
126 stat2016_fake_SRB6
127 EleTau_stat18_sig_SRB12
128 stat2016_fake_SRB5
129 EleTau_stat17_TT_SRB4
130 MuTau_stat18_sig_SRB10
131 stat2016_TT_SRB2
132 MuTau_stat17_sig_SRB8
133 stat2017_sig_SRB5
134 syst2016_unclusteredEnergy
135 stat2018_sig_SRB7
136 syst2017_bTaggingSF
137 EleTau_stat16_TT_SRB1
138 EleTau_stat16_TT_SRB4
139 MuTau_stat17_TT_SRB12
140 syst2017_extraMetUnc
141 stat2017_sig_SRB1
142 stat2017_fake_SRB3
143 EleTau_stat17_Fake_SRB15
144 EleTau_stat17_sig_SRB9
145 EleTau_stat17_TT_SRB6
146 EleTau_stat18_sig_SRB9
147 MuTau_stat17_TT_SRB3
148 MuTau_stat16_TT_SRB1
149 stat2017_TT_SRB2
150 MuTau_stat16_TT_SRB3
−2
−1
0
1
2
−0.005
0
0.005
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂

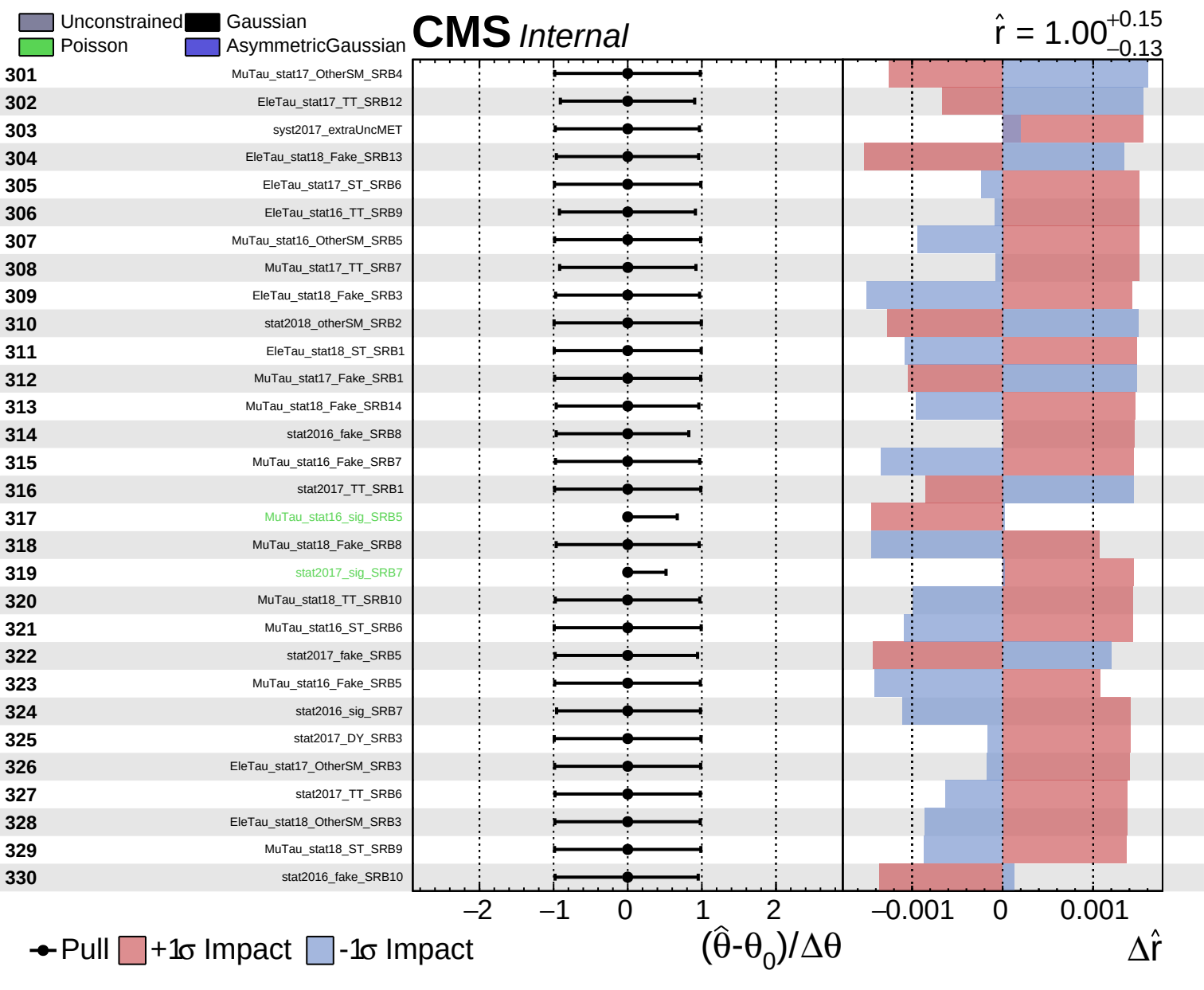

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
151 stat2016_fake_SRB7
152 stat2017_otherSM_SRB10
153 stat2018_sig_SRB6
154 stat2018_fake_SRB12
155 MuTau_stat17_sig_SRB9
156 EleTau_stat17_sig_SRB5
157 EleTau_stat16_TT_SRB5
158 stat2017_fake_SRB6
159 MuTau_stat16_sig_SRB2
160 stat2018_fake_SRB11
161 stat2016_TT_SRB3
162 stat2017_fake_SRB11
163 EleTau_stat16_sig_SRB11
164 stat2017_DY_SRB2
165 MuTau_stat18_sig_SRB2
166 stat2016_fake_SRB13
167 EleTau_stat16_TT_SRB3
168 MuTau_stat16_TT_SRB4
169 EleTau_stat16_TT_SRB2
170 stat2016_TT_SRB5
171 MuTau_stat16_sig_SRB6
172 MuTau_stat16_sig_SRB9
173 EleTau_stat17_TT_SRB3
174 MuTau_stat17_TT_SRB4
175 stat2017_TT_SRB3
176 stat2018_fake_SRB5
177 MuTau_stat16_TT_SRB5
178 stat2017_DY_SRB10
179 stat2016_DY_SRB4
180 MuTau_stat18_sig_SRB6
−2 −1 0 1 2
−0.005 0 0.005
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂

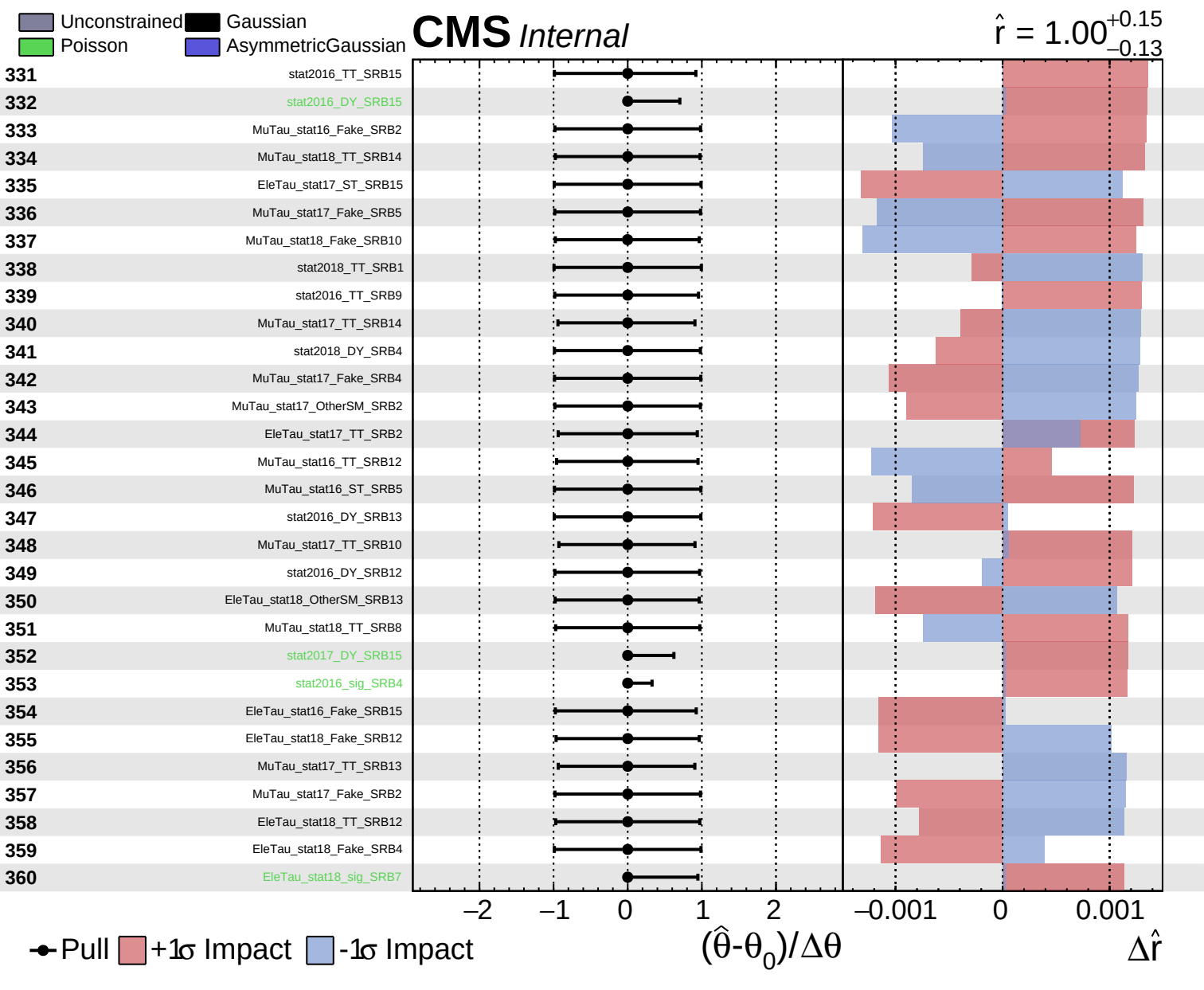

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
181 syst2016_muFastSim
182 stat2018_sig_SRB3
183 EleTau_stat17_sig_SRB11
184 stat2018_DY_SRB7
185 stat2017_fake_SRB4
186 MuTau_stat16_TT_SRB2
187 stat2017_TT_SRB9
188 MuTau_stat17_TT_SRB1
189 MuTau_stat18_sig_SRB11
190 stat2017_DY_SRB9
191 stat2018_DY_SRB1
192 stat2016_DY_SRB5
193 stat2016_sig_SRB5
194 MuTau_stat18_sig_SRB12
195 MuTau_stat16_TT_SRB7
196 EleTau_stat18_OtherSM_SRB1
197 stat2018_fake_SRB9
198 MuTau_stat17_TT_SRB5
199 MuTau_stat18_OtherSM_SRB4
200 MuTau_stat18_OtherSM_SRB1
201 stat2016_DY_SRB2
202 EleTau_stat18_sig_SRB11
203 MuTau_stat16_Fake_SRB6
204 MuTau_stat18_TT_SRB5
205 EleTau_stat18_sig_SRB3
206 stat2018_DY_SRB2
207 EleTau_stat17_TT_SRB15
208 stat2018_fake_SRB6
209 EleTau_stat17_sig_SRB2
210 MuTau_stat18_sig_SRB8
−2 −1 0 1 2
−0.004 −0.002 0 0.002 0.004
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

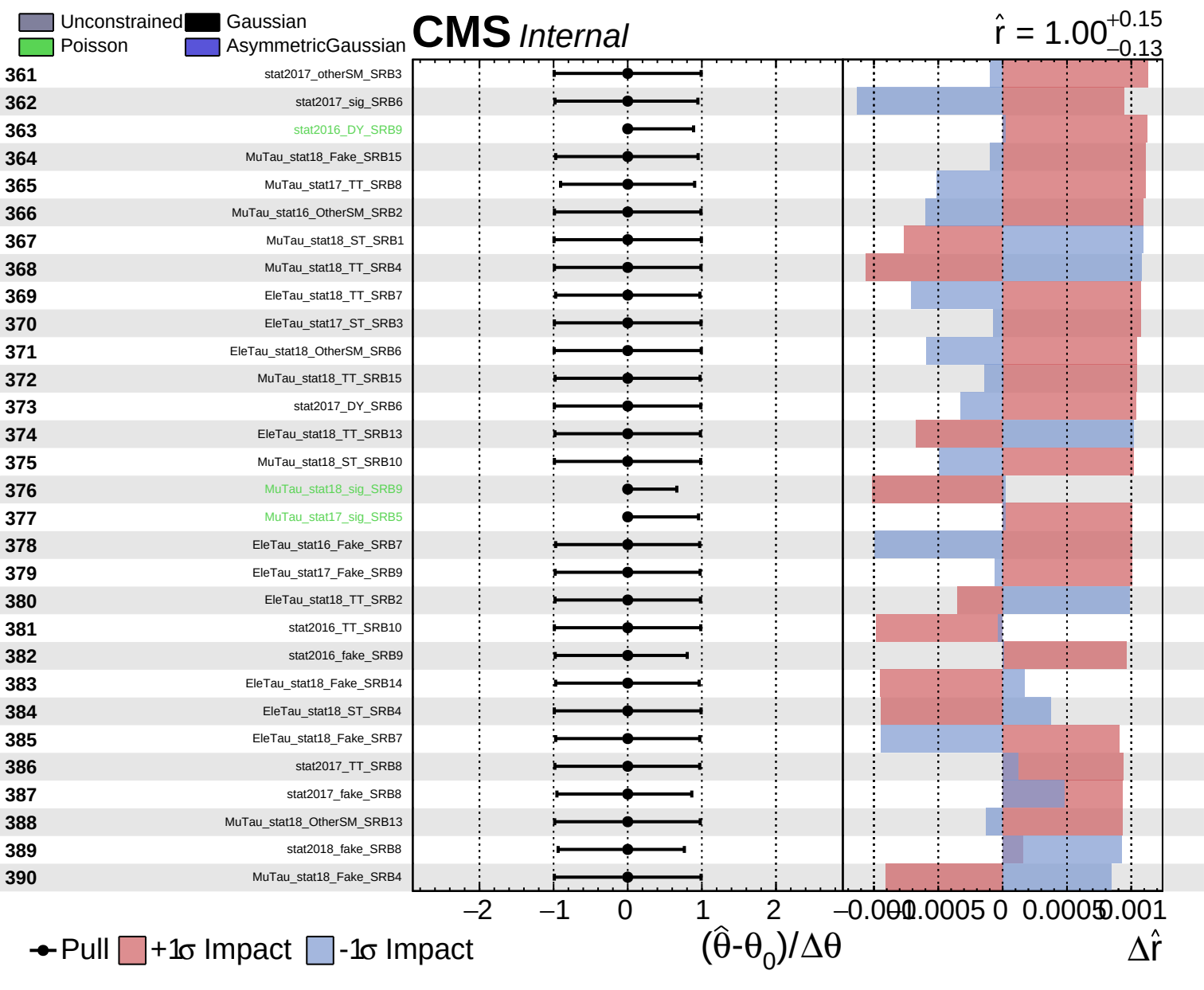

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
211 stat2018_DY_SRB15
212 stat2016_DY_SRB3
213 syst2017_pileupReweight
214 stat2017_TT_SRB4
215 stat2018_DY_SRB13
216 stat2017_sig_SRB3
217 stat2016_TT_SRB1
218 MuTau_stat18_OtherSM_SRB5
219 MuTau_stat17_Fake_SRB12
220 syst2016_eleFastSim
221 MuTau_stat17_TT_SRB2
222 stat2018_TT_SRB7
223 stat2018_otherSM_SRB15
224 EleTau_stat18_TT_SRB6
225 EleTau_stat17_TT_SRB9
226 MuTau_stat17_sig_SRB11
227 EleTau_stat18_Fake_SRB6
228 stat2017_DY_SRB7
229 MuTau_stat17_Fake_SRB3
230 EleTau_stat18_TT_SRB1
231 MuTau_stat16_sig_SRB11
232 stat2017_fake_SRB9
233 EleTau_stat16_sig_SRB6
234 stat2017_TT_SRB11
235 syst2016_bTaggingSF
236 stat2018_otherSM_SRB7
237 MuTau_stat16_sig_SRB12
238 EleTau_stat16_Fake_SRB1
239 EleTau_stat16_TT_SRB7
240 MuTau_stat17_TT_SRB9
−2 −1 0 1 2
−0.002 0 0.002
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

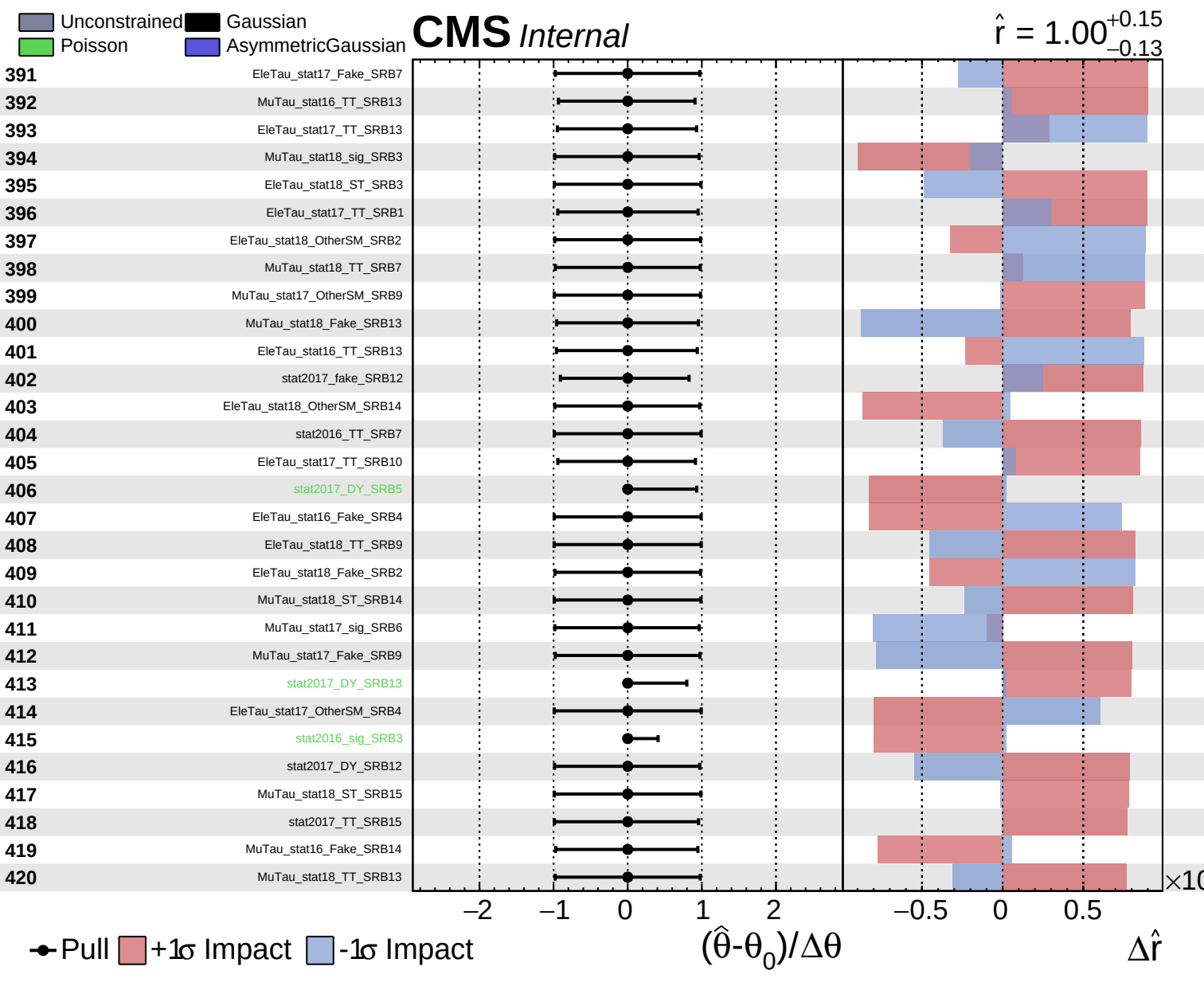

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
241 MuTau_stat16_TT_SRB9
242 EleTau_stat17_ST_SRB4
243 MuTau_stat18_sig_SRB7
244 MuTau_stat16_TT_SRB11
245 EleTau_stat18_Fake_SRB1
246 MuTau_stat18_Fake_SRB5
247 MuTau_stat17_OtherSM_SRB1
248 MuTau_stat18_TT_SRB9
249 syst2018_pileupReweight
250 MuTau_stat16_Fake_SRB3
251 EleTau_stat17_Fake_SRB6
252 stat2017_DY_SRB11
253 stat2016_DY_SRB1
254 EleTau_stat17_Fake_SRB4
255 EleTau_stat17_TT_SRB7
256 stat2018_fake_SRB4
257 stat2016_fake_SRB11
258 MuTau_stat16_Fake_SRB1
259 tauFakeRateRegion
260 stat2017_DY_SRB1
261 stat2018_DY_SRB5
262 stat2018_DY_SRB12
263 stat2016_otherSM_SRB4
264 stat2018_fake_SRB3
265 MuTau_stat16_OtherSM_SRB1
266 MuTau_stat18_Fake_SRB9
267 MuTau_stat17_TT_SRB6
268 EleTau_stat16_Fake_SRB3
269 MuTau_stat16_OtherSM_SRB3
270 stat2016_otherSM_SRB5
−2 −1 0 1 2
−0.002 0 0.002
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

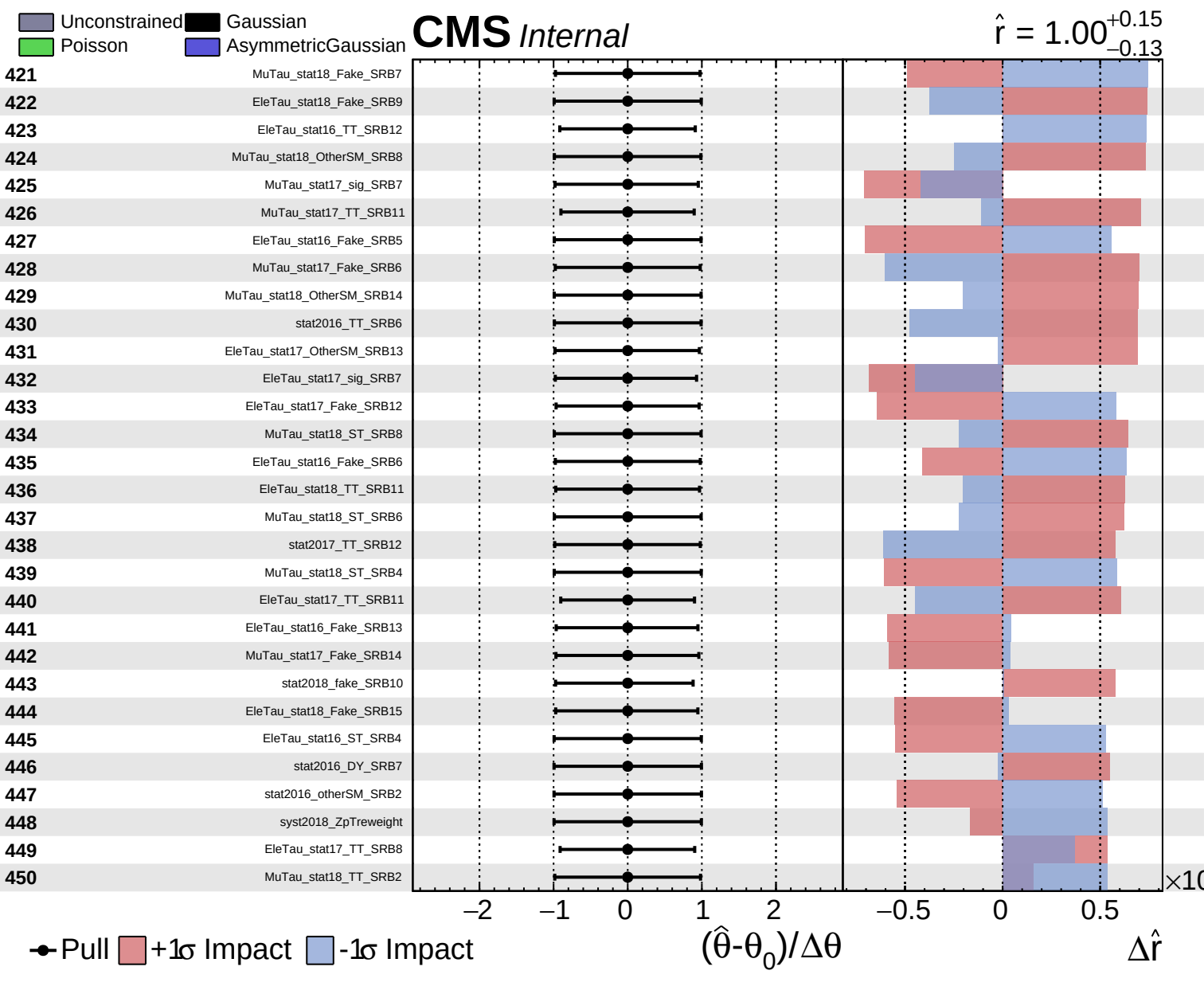

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
271 stat2018_TT_SRB2
272 syst2018_extraMt2Unc
273 stat2017_TT_SRB5
274 MuTau_stat18_ST_SRB5
275 stat2018_fake_SRB15
276 MuTau_stat18_TT_SRB1
277 EleTau_stat18_TT_SRB4
278 EleTau_stat17_sig_SRB1
279 MuTau_stat18_Fake_SRB1
280 EleTau_stat16_TT_SRB6
281 EleTau_stat16_TT_SRB11
282 stat2016_TT_SRB8
283 stat2017_TT_SRB10
284 EleTau_stat17_TT_SRB5
285 EleTau_stat18_sig_SRB6
286 EleTau_stat17_Fake_SRB3
287 syst2018_extraUncMT2
288 stat2018_fake_SRB13
289 MuTau_stat18_Fake_SRB6
290 EleTau_stat18_TT_SRB3
291 MuTau_stat18_TT_SRB6
292 EleTau_stat17_OtherSM_SRB6
293 EleTau_stat18_ST_SRB6
294 EleTau_stat16_Fake_SRB2
295 EleTau_stat17_sig_SRB6
296 stat2016_TT_SRB11
297 EleTau_stat18_OtherSM_SRB4
298 stat2018_DY_SRB9
299 EleTau_stat16_OtherSM_SRB3
300 stat2016_sig_SRB6
−2 −1 0 1 2
−0.002 −0.001 0 0.001 0.002
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

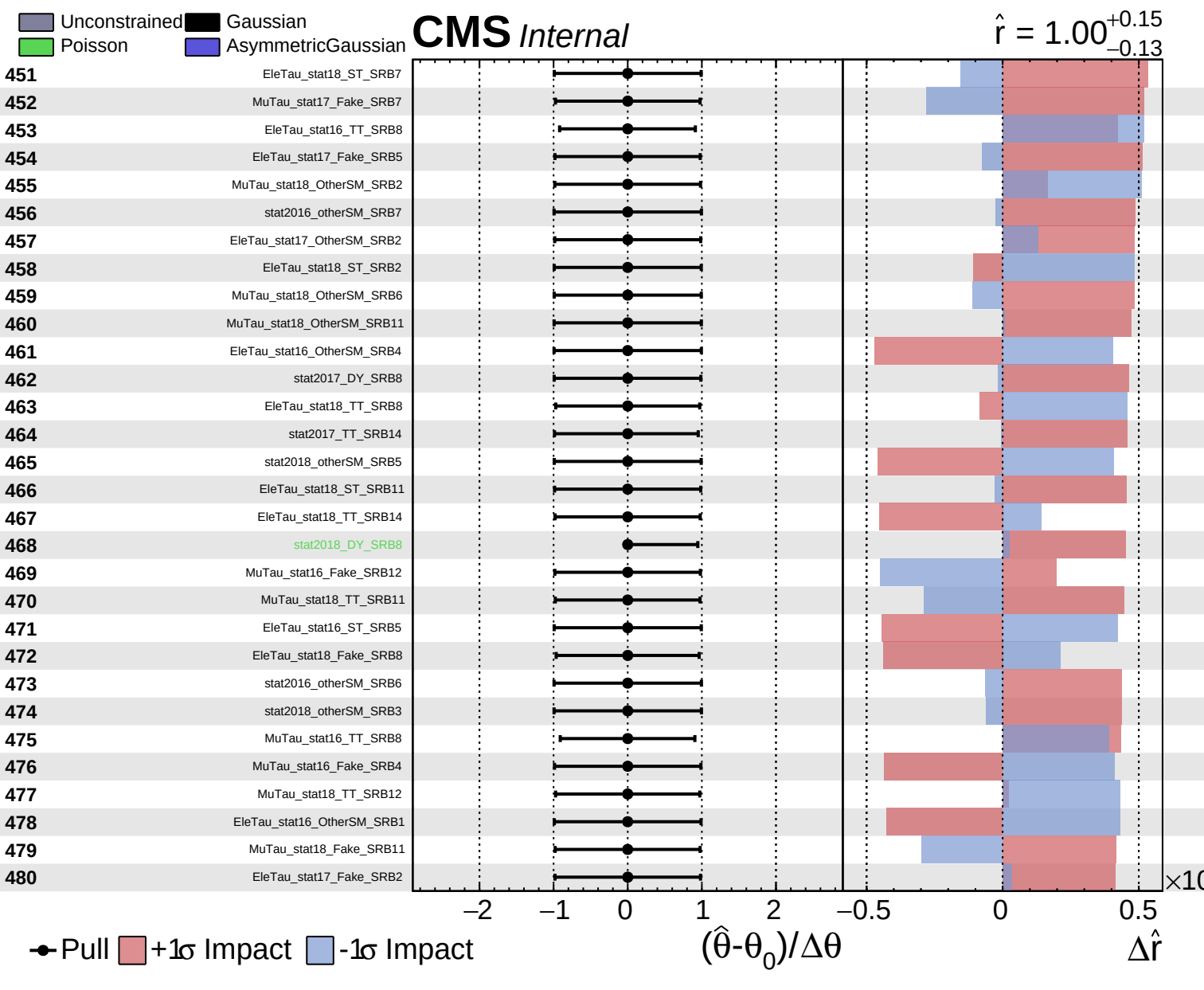

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
301 MuTau_stat17_OtherSM_SRB4
302 EleTau_stat17_TT_SRB12
303 syst2017_extraUncMET
304 EleTau_stat18_Fake_SRB13
305 EleTau_stat17_ST_SRB6
306 EleTau_stat16_TT_SRB9
307 MuTau_stat16_OtherSM_SRB5
308 MuTau_stat17_TT_SRB7
309 EleTau_stat18_Fake_SRB3
310 stat2018_otherSM_SRB2
311 EleTau_stat18_ST_SRB1
312 MuTau_stat17_Fake_SRB1
313 MuTau_stat18_Fake_SRB14
314 stat2016_fake_SRB8
315 MuTau_stat16_Fake_SRB7
316 stat2017_TT_SRB1
317 MuTau_stat16_sig_SRB5
318 MuTau_stat18_Fake_SRB8
319 stat2017_sig_SRB7
320 MuTau_stat18_TT_SRB10
321 MuTau_stat16_ST_SRB6
322 stat2017_fake_SRB5
323 MuTau_stat16_Fake_SRB5
324 stat2016_sig_SRB7
325 stat2017_DY_SRB3
326 EleTau_stat17_OtherSM_SRB3
327 stat2017_TT_SRB6
328 EleTau_stat18_OtherSM_SRB3
329 MuTau_stat18_ST_SRB9
330 stat2016_fake_SRB10
−2 −1 0 1 2
−0.001 0 0.001
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

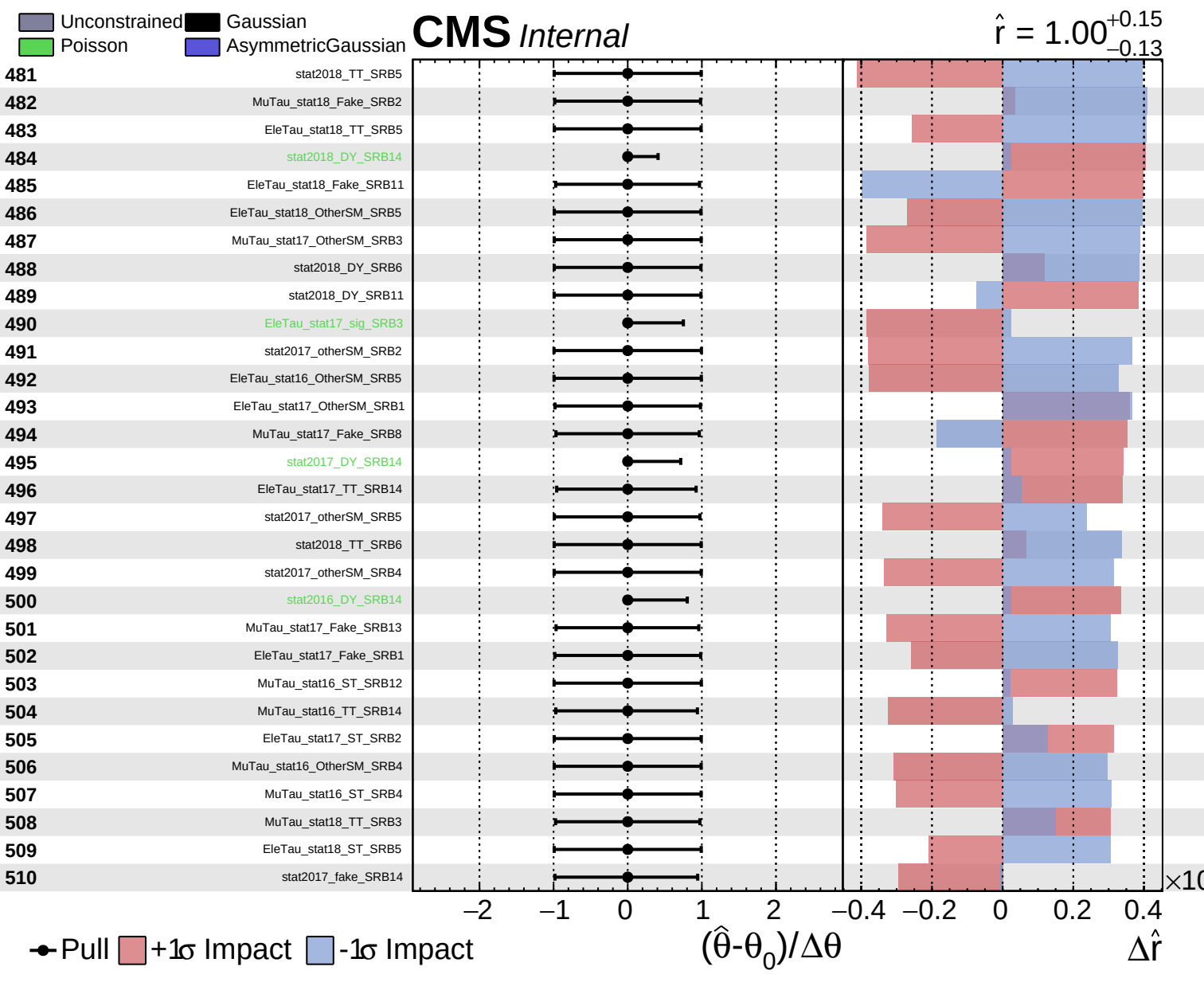

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
331 stat2016_TT_SRB15
332 stat2016_DY_SRB15
333 MuTau_stat16_Fake_SRB2
334 MuTau_stat18_TT_SRB14
335 EleTau_stat17_ST_SRB15
336 MuTau_stat17_Fake_SRB5
337 MuTau_stat18_Fake_SRB10
338 stat2018_TT_SRB1
339 stat2016_TT_SRB9
340 MuTau_stat17_TT_SRB14
341 stat2018_DY_SRB4
342 MuTau_stat17_Fake_SRB4
343 MuTau_stat17_OtherSM_SRB2
344 EleTau_stat17_TT_SRB2
345 MuTau_stat16_TT_SRB12
346 MuTau_stat16_ST_SRB5
347 stat2016_DY_SRB13
348 MuTau_stat17_TT_SRB10
349 stat2016_DY_SRB12
350 EleTau_stat18_OtherSM_SRB13
351 MuTau_stat18_TT_SRB8
352 stat2017_DY_SRB15
353 stat2016_sig_SRB4
354 EleTau_stat16_Fake_SRB15
355 EleTau_stat18_Fake_SRB12
356 MuTau_stat17_TT_SRB13
357 MuTau_stat17_Fake_SRB2
358 EleTau_stat18_TT_SRB12
359 EleTau_stat18_Fake_SRB4
360 EleTau_stat18_sig_SRB7
−2 −1 0 1 2
−0.001 0 0.001
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

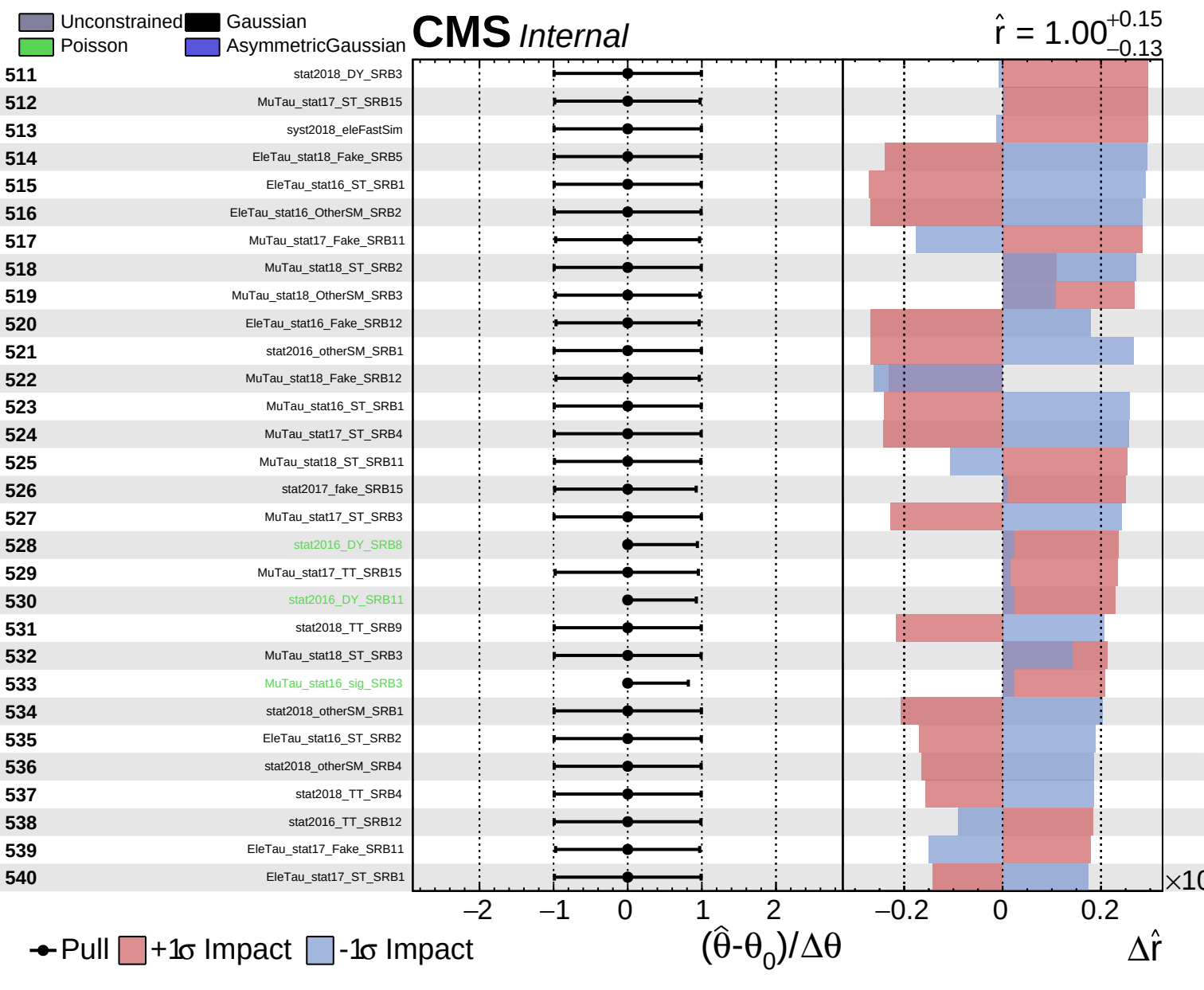

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
361 stat2017_otherSM_SRB3
362 stat2017_sig_SRB6
363 stat2016_DY_SRB9
364 MuTau_stat18_Fake_SRB15
365 MuTau_stat17_TT_SRB8
366 MuTau_stat16_OtherSM_SRB2
367 MuTau_stat18_ST_SRB1
368 MuTau_stat18_TT_SRB4
369 EleTau_stat18_TT_SRB7
370 EleTau_stat17_ST_SRB3
371 EleTau_stat18_OtherSM_SRB6
372 MuTau_stat18_TT_SRB15
373 stat2017_DY_SRB6
374 EleTau_stat18_TT_SRB13
375 MuTau_stat18_ST_SRB10
376 MuTau_stat18_sig_SRB9
377 MuTau_stat17_sig_SRB5
378 EleTau_stat16_Fake_SRB7
379 EleTau_stat17_Fake_SRB9
380 EleTau_stat18_TT_SRB2
381 stat2016_TT_SRB10
382 stat2016_fake_SRB9
383 EleTau_stat18_Fake_SRB14
384 EleTau_stat18_ST_SRB4
385 EleTau_stat18_Fake_SRB7
386 stat2017_TT_SRB8
387 stat2017_fake_SRB8
388 MuTau_stat18_OtherSM_SRB13
389 stat2018_fake_SRB8
390 MuTau_stat18_Fake_SRB4
−2 −1 0 1 2
−0.001 −0.0005 0 0.0005 0.001
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

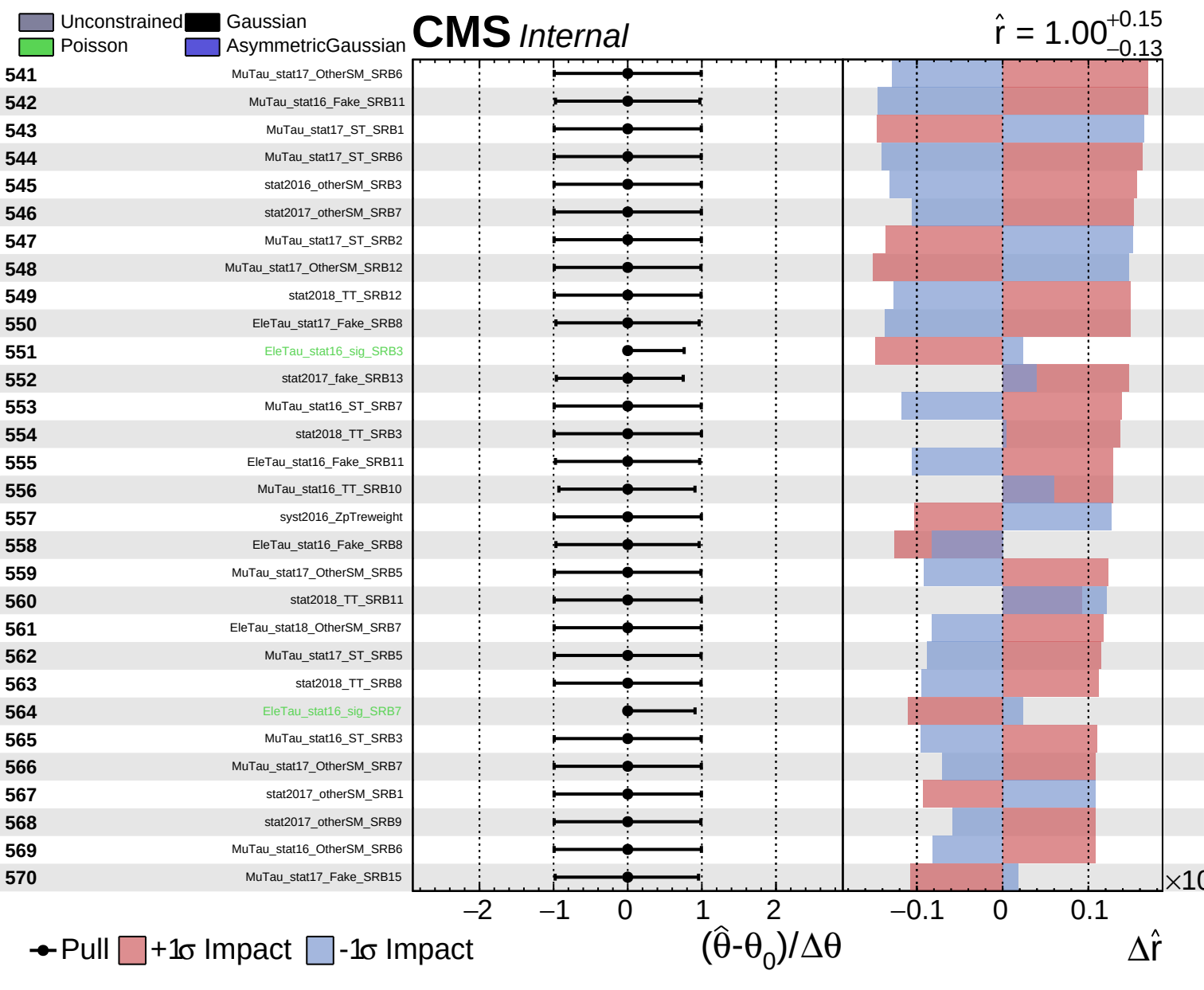

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
391 EleTau_stat17_Fake_SRB7
392 MuTau_stat16_TT_SRB13
393 EleTau_stat17_TT_SRB13
394 MuTau_stat18_sig_SRB3
395 EleTau_stat18_ST_SRB3
396 EleTau_stat17_TT_SRB1
397 EleTau_stat18_OtherSM_SRB2
398 MuTau_stat18_TT_SRB7
399 MuTau_stat17_OtherSM_SRB9
400 MuTau_stat18_Fake_SRB13
401 EleTau_stat16_TT_SRB13
402 stat2017_fake_SRB12
403 EleTau_stat18_OtherSM_SRB14
404 stat2016_TT_SRB7
405 EleTau_stat17_TT_SRB10
406 stat2017_DY_SRB5
407 EleTau_stat16_Fake_SRB4
408 EleTau_stat18_TT_SRB9
409 EleTau_stat18_Fake_SRB2
410 MuTau_stat18_ST_SRB14
411 MuTau_stat17_sig_SRB6
412 MuTau_stat17_Fake_SRB9
413 stat2017_DY_SRB13
414 EleTau_stat17_OtherSM_SRB4
415 stat2016_sig_SRB3
416 stat2017_DY_SRB12
417 MuTau_stat18_ST_SRB15
418 stat2017_TT_SRB15
419 MuTau_stat16_Fake_SRB14
420 MuTau_stat18_TT_SRB13
×10
−2 −1 0 1 2
−0.5 0 0.5
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

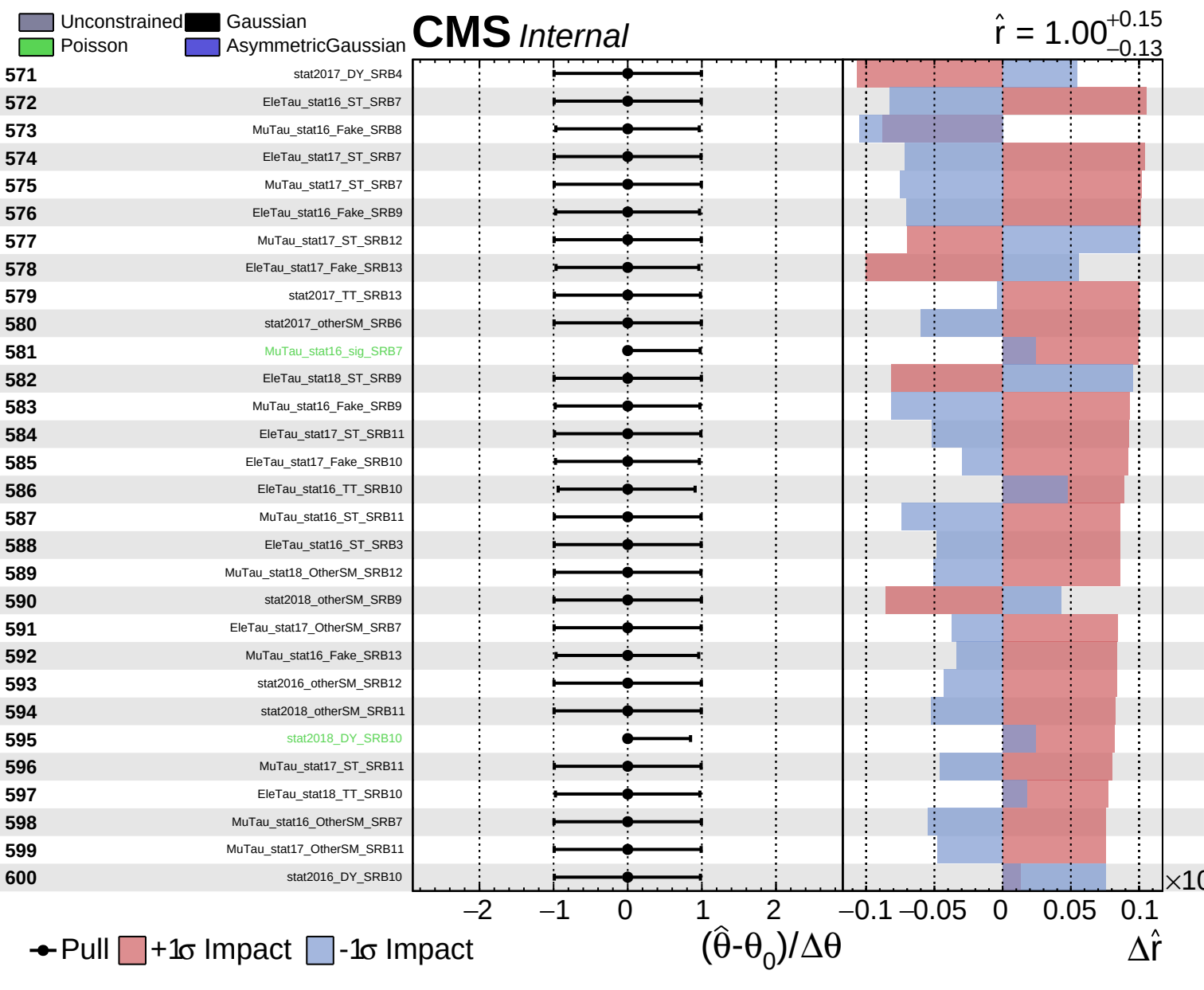

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
421 MuTau_stat18_Fake_SRB7
422 EleTau_stat18_Fake_SRB9
423 EleTau_stat16_TT_SRB12
424 MuTau_stat18_OtherSM_SRB8
425 MuTau_stat17_sig_SRB7
426 MuTau_stat17_TT_SRB11
427 EleTau_stat16_Fake_SRB5
428 MuTau_stat17_Fake_SRB6
429 MuTau_stat18_OtherSM_SRB14
430 stat2016_TT_SRB6
431 EleTau_stat17_OtherSM_SRB13
432 EleTau_stat17_sig_SRB7
433 EleTau_stat17_Fake_SRB12
434 MuTau_stat18_ST_SRB8
435 EleTau_stat16_Fake_SRB6
436 EleTau_stat18_TT_SRB11
437 MuTau_stat18_ST_SRB6
438 stat2017_TT_SRB12
439 MuTau_stat18_ST_SRB4
440 EleTau_stat17_TT_SRB11
441 EleTau_stat16_Fake_SRB13
442 MuTau_stat17_Fake_SRB14
443 stat2018_fake_SRB10
444 EleTau_stat18_Fake_SRB15
445 EleTau_stat16_ST_SRB4
446 stat2016_DY_SRB7
447 stat2016_otherSM_SRB2
448 syst2018_ZpTreweight
449 EleTau_stat17_TT_SRB8
450 MuTau_stat18_TT_SRB2
−2 −1 0 1 2
−0.5 0 0.5
×10
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

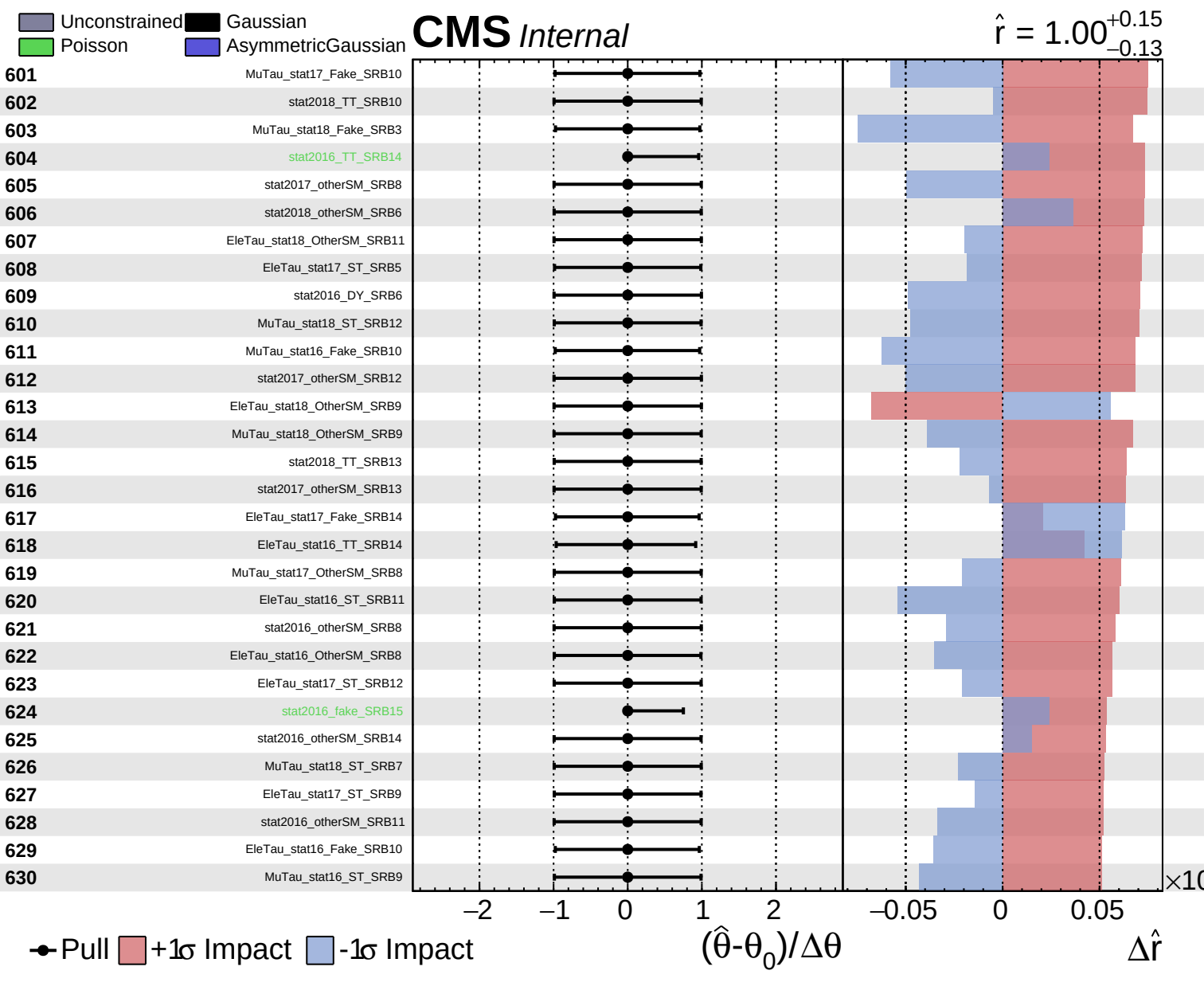

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
451 EleTau_stat18_ST_SRB7
452 MuTau_stat17_Fake_SRB7
453 EleTau_stat16_TT_SRB8
454 EleTau_stat17_Fake_SRB5
455 MuTau_stat18_OtherSM_SRB2
456 stat2016_otherSM_SRB7
457 EleTau_stat17_OtherSM_SRB2
458 EleTau_stat18_ST_SRB2
459 MuTau_stat18_OtherSM_SRB6
460 MuTau_stat18_OtherSM_SRB11
461 EleTau_stat16_OtherSM_SRB4
462 stat2017_DY_SRB8
463 EleTau_stat18_TT_SRB8
464 stat2017_TT_SRB14
465 stat2018_otherSM_SRB5
466 EleTau_stat18_ST_SRB11
467 EleTau_stat18_TT_SRB14
468 stat2018_DY_SRB8
469 MuTau_stat16_Fake_SRB12
470 MuTau_stat18_TT_SRB11
471 EleTau_stat16_ST_SRB5
472 EleTau_stat18_Fake_SRB8
473 stat2016_otherSM_SRB6
474 stat2018_otherSM_SRB3
475 MuTau_stat16_TT_SRB8
476 MuTau_stat16_Fake_SRB4
477 MuTau_stat18_TT_SRB12
478 EleTau_stat16_OtherSM_SRB1
479 MuTau_stat18_Fake_SRB11
480 EleTau_stat17_Fake_SRB2
−2 −1 0 1 2
−0.5 0 0.5
×10
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

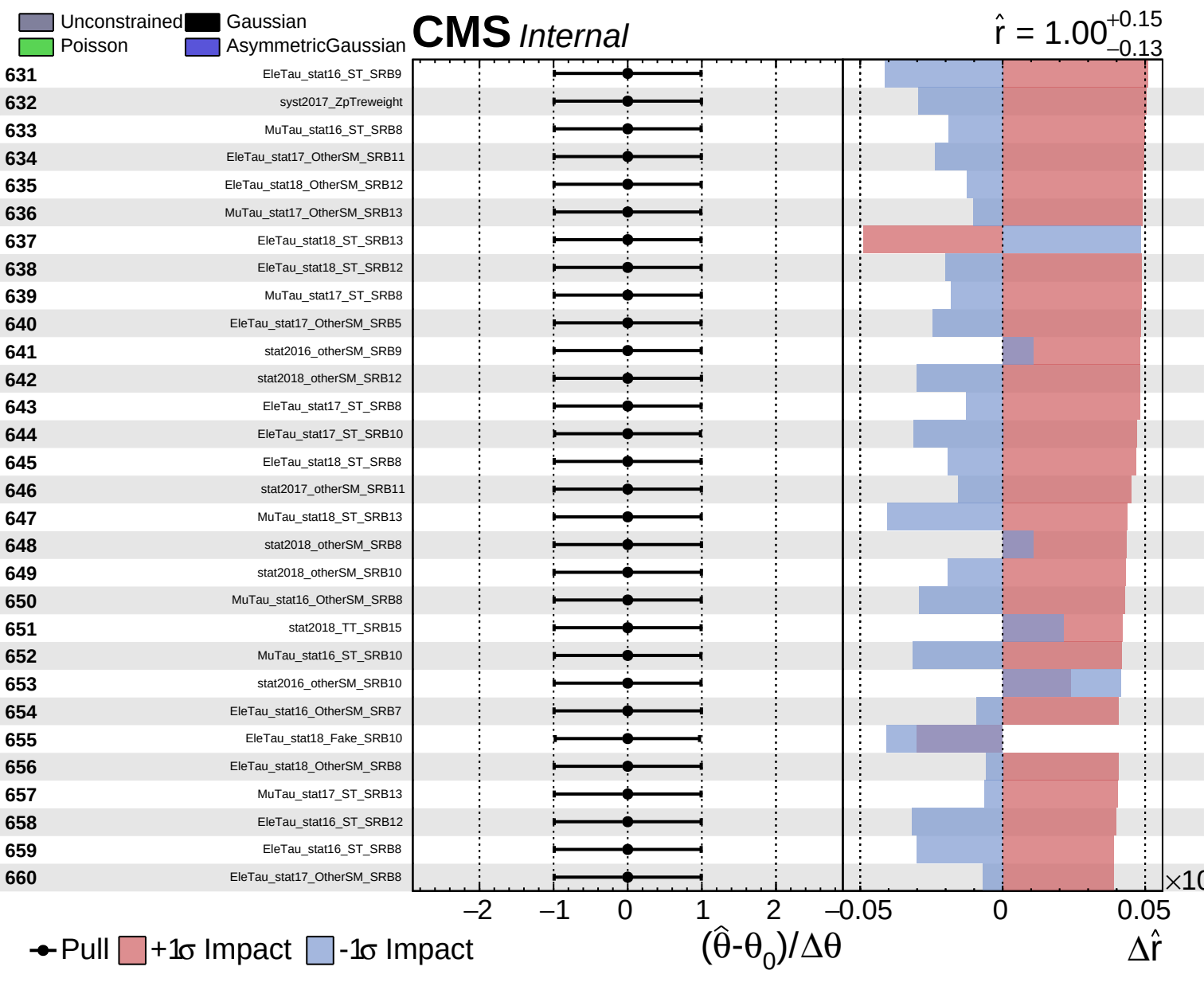

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
481 stat2018_TT_SRB5
482 MuTau_stat18_Fake_SRB2
483 EleTau_stat18_TT_SRB5
484 stat2018_DY_SRB14
485 EleTau_stat18_Fake_SRB11
486 EleTau_stat18_OtherSM_SRB5
487 MuTau_stat17_OtherSM_SRB3
488 stat2018_DY_SRB6
489 stat2018_DY_SRB11
490 EleTau_stat17_sig_SRB3
491 stat2017_otherSM_SRB2
492 EleTau_stat16_OtherSM_SRB5
493 EleTau_stat17_OtherSM_SRB1
494 MuTau_stat17_Fake_SRB8
495 stat2017_DY_SRB14
496 EleTau_stat17_TT_SRB14
497 stat2017_otherSM_SRB5
498 stat2018_TT_SRB6
499 stat2017_otherSM_SRB4
500 stat2016_DY_SRB14
501 MuTau_stat17_Fake_SRB13
502 EleTau_stat17_Fake_SRB1
503 MuTau_stat16_ST_SRB12
504 MuTau_stat16_TT_SRB14
505 EleTau_stat17_ST_SRB2
506 MuTau_stat16_OtherSM_SRB4
507 MuTau_stat16_ST_SRB4
508 MuTau_stat18_TT_SRB3
509 EleTau_stat18_ST_SRB5
510 stat2017_fake_SRB14
−2 −1 0 1 2
−0.4 −0.2 0 0.2 0.4
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂

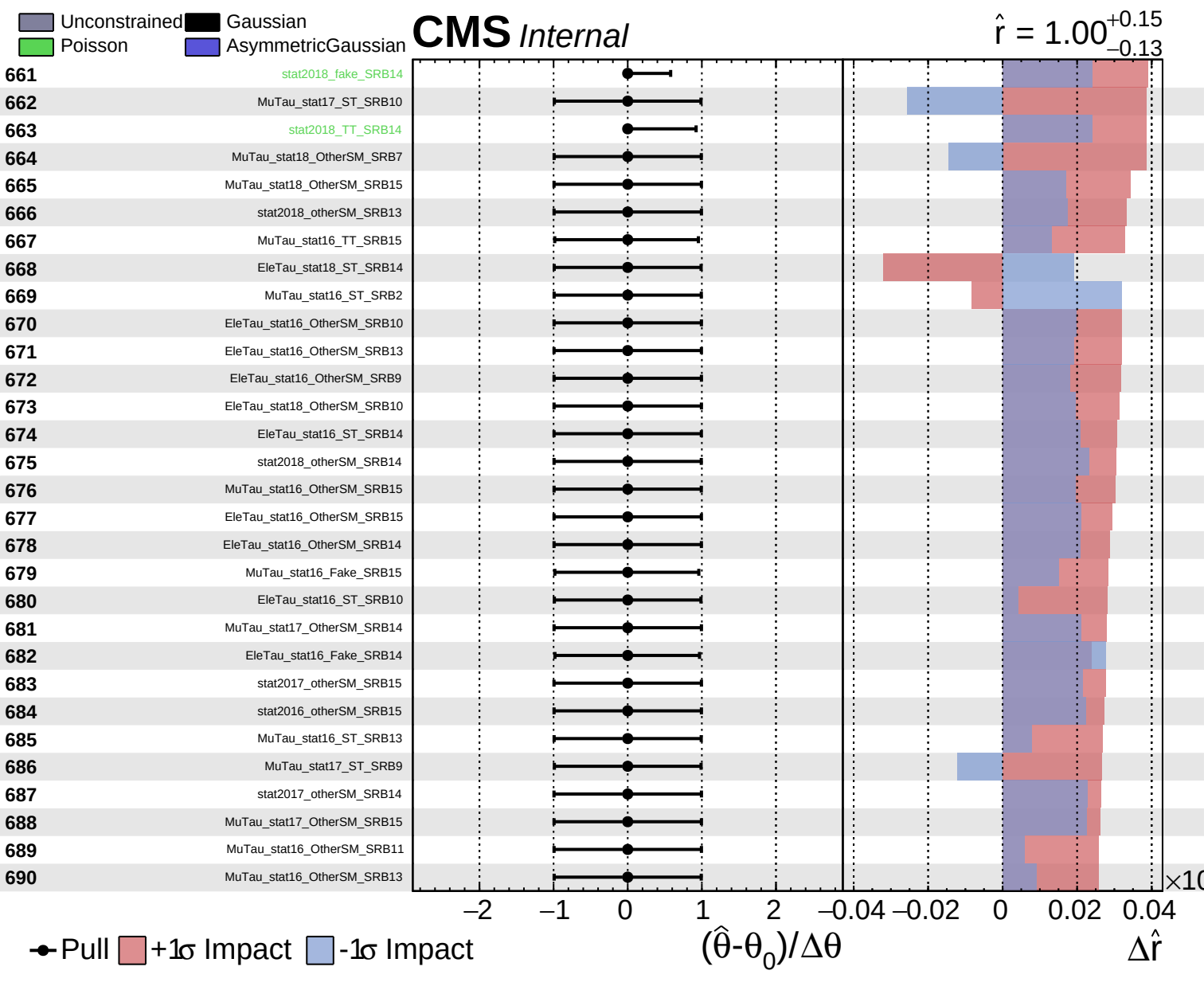

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
511 stat2018_DY_SRB3
512 MuTau_stat17_ST_SRB15
513 syst2018_eleFastSim
514 EleTau_stat18_Fake_SRB5
515 EleTau_stat16_ST_SRB1
516 EleTau_stat16_OtherSM_SRB2
517 MuTau_stat17_Fake_SRB11
518 MuTau_stat18_ST_SRB2
519 MuTau_stat18_OtherSM_SRB3
520 EleTau_stat16_Fake_SRB12
521 stat2016_otherSM_SRB1
522 MuTau_stat18_Fake_SRB12
523 MuTau_stat16_ST_SRB1
524 MuTau_stat17_ST_SRB4
525 MuTau_stat18_ST_SRB11
526 stat2017_fake_SRB15
527 MuTau_stat17_ST_SRB3
528 stat2016_DY_SRB8
529 MuTau_stat17_TT_SRB15
530 stat2016_DY_SRB11
531 stat2018_TT_SRB9
532 MuTau_stat18_ST_SRB3
533 MuTau_stat16_sig_SRB3
534 stat2018_otherSM_SRB1
535 EleTau_stat16_ST_SRB2
536 stat2018_otherSM_SRB4
537 stat2018_TT_SRB4
538 stat2016_TT_SRB12
539 EleTau_stat17_Fake_SRB11
540 EleTau_stat17_ST_SRB1
−2 −1 0 1 2
−0.2 0 0.2
×10
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

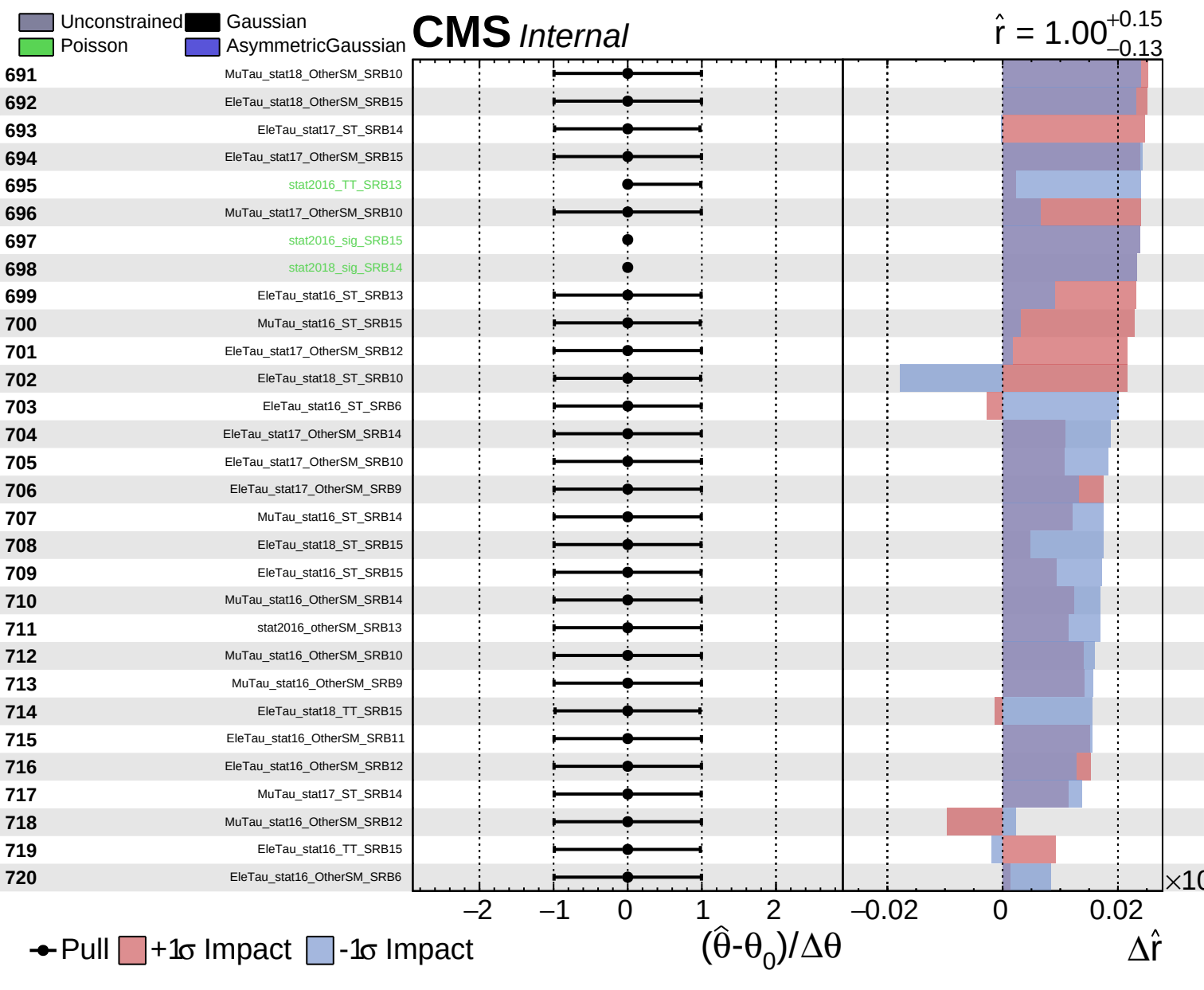

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
541 MuTau_stat17_OtherSM_SRB6
542 MuTau_stat16_Fake_SRB11
543 MuTau_stat17_ST_SRB1
544 MuTau_stat17_ST_SRB6
545 stat2016_otherSM_SRB3
546 stat2017_otherSM_SRB7
547 MuTau_stat17_ST_SRB2
548 MuTau_stat17_OtherSM_SRB12
549 stat2018_TT_SRB12
550 EleTau_stat17_Fake_SRB8
551 EleTau_stat16_sig_SRB3
552 stat2017_fake_SRB13
553 MuTau_stat16_ST_SRB7
554 stat2018_TT_SRB3
555 EleTau_stat16_Fake_SRB11
556 MuTau_stat16_TT_SRB10
557 syst2016_ZpTreweight
558 EleTau_stat16_Fake_SRB8
559 MuTau_stat17_OtherSM_SRB5
560 stat2018_TT_SRB11
561 EleTau_stat18_OtherSM_SRB7
562 MuTau_stat17_ST_SRB5
563 stat2018_TT_SRB8
564 EleTau_stat16_sig_SRB7
565 MuTau_stat16_ST_SRB3
566 MuTau_stat17_OtherSM_SRB7
567 stat2017_otherSM_SRB1
568 stat2017_otherSM_SRB9
569 MuTau_stat16_OtherSM_SRB6
570 MuTau_stat17_Fake_SRB15
−2
−1
0
1
2
−0.1
0
0.1
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂

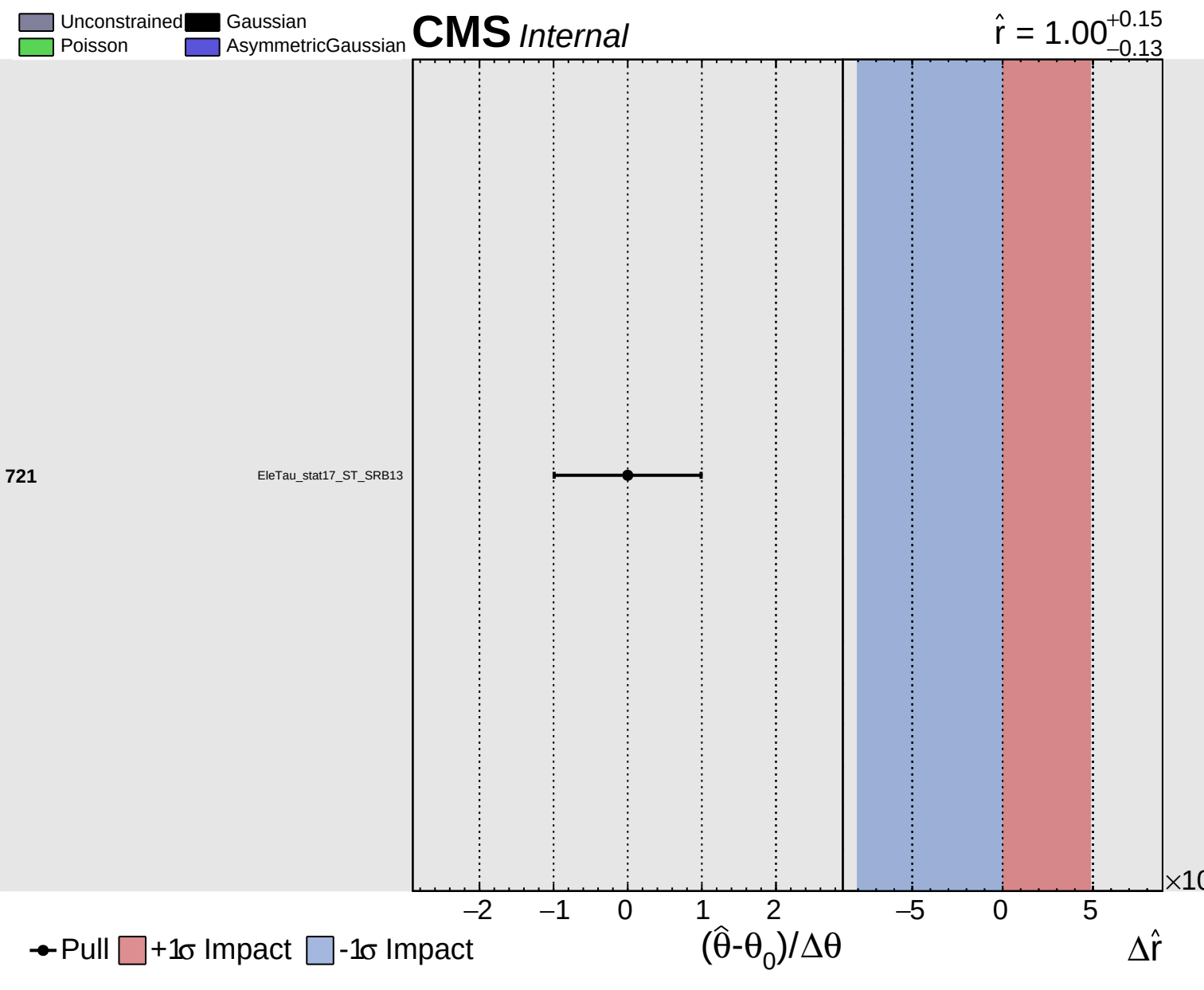

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
571 stat2017_DY_SRB4
572 EleTau_stat16_ST_SRB7
573 MuTau_stat16_Fake_SRB8
574 EleTau_stat17_ST_SRB7
575 MuTau_stat17_ST_SRB7
576 EleTau_stat16_Fake_SRB9
577 MuTau_stat17_ST_SRB12
578 EleTau_stat17_Fake_SRB13
579 stat2017_TT_SRB13
580 stat2017_otherSM_SRB6
581 MuTau_stat16_sig_SRB7
582 EleTau_stat18_ST_SRB9
583 MuTau_stat16_Fake_SRB9
584 EleTau_stat17_ST_SRB11
585 EleTau_stat17_Fake_SRB10
586 EleTau_stat16_TT_SRB10
587 MuTau_stat16_ST_SRB11
588 EleTau_stat16_ST_SRB3
589 MuTau_stat18_OtherSM_SRB12
590 stat2018_otherSM_SRB9
591 EleTau_stat17_OtherSM_SRB7
592 MuTau_stat16_Fake_SRB13
593 stat2016_otherSM_SRB12
594 stat2018_otherSM_SRB11
595 stat2018_DY_SRB10
596 MuTau_stat17_ST_SRB11
597 EleTau_stat18_TT_SRB10
598 MuTau_stat16_OtherSM_SRB7
599 MuTau_stat17_OtherSM_SRB11
600 stat2016_DY_SRB10
−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 +0.15 −0.13
601 MuTau_stat17_Fake_SRB10
602 stat2018_TT_SRB10
603 MuTau_stat18_Fake_SRB3
604 stat2016_TT_SRB14
605 stat2017_otherSM_SRB8
606 stat2018_otherSM_SRB6
607 EleTau_stat18_OtherSM_SRB11
608 EleTau_stat17_ST_SRB5
609 stat2016_DY_SRB6
610 MuTau_stat18_ST_SRB12
611 MuTau_stat16_Fake_SRB10
612 stat2017_otherSM_SRB12
613 EleTau_stat18_OtherSM_SRB9
614 MuTau_stat18_OtherSM_SRB9
615 stat2018_TT_SRB13
616 stat2017_otherSM_SRB13
617 EleTau_stat17_Fake_SRB14
618 EleTau_stat16_TT_SRB14
619 MuTau_stat17_OtherSM_SRB8
620 EleTau_stat16_ST_SRB11
621 stat2016_otherSM_SRB8
622 EleTau_stat16_OtherSM_SRB8
623 EleTau_stat17_ST_SRB12
624 stat2016_fake_SRB15
625 stat2016_otherSM_SRB14
626 MuTau_stat18_ST_SRB7
627 EleTau_stat17_ST_SRB9
628 stat2016_otherSM_SRB11
629 EleTau_stat16_Fake_SRB10
630 MuTau_stat16_ST_SRB9
−2 −1 0 1 2
−0.05 0 0.05
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
631 EleTau_stat16_ST_SRB9
632 syst2017_ZpTreweight
633 MuTau_stat16_ST_SRB8
634 EleTau_stat17_OtherSM_SRB11
635 EleTau_stat18_OtherSM_SRB12
636 MuTau_stat17_OtherSM_SRB13
637 EleTau_stat18_ST_SRB13
638 EleTau_stat18_ST_SRB12
639 MuTau_stat17_ST_SRB8
640 EleTau_stat17_OtherSM_SRB5
641 stat2016_otherSM_SRB9
642 stat2018_otherSM_SRB12
643 EleTau_stat17_ST_SRB8
644 EleTau_stat17_ST_SRB10
645 EleTau_stat18_ST_SRB8
646 stat2017_otherSM_SRB11
647 MuTau_stat18_ST_SRB13
648 stat2018_otherSM_SRB8
649 stat2018_otherSM_SRB10
650 MuTau_stat16_OtherSM_SRB8
651 stat2018_TT_SRB15
652 MuTau_stat16_ST_SRB10
653 stat2016_otherSM_SRB10
654 EleTau_stat16_OtherSM_SRB7
655 EleTau_stat18_Fake_SRB10
656 EleTau_stat18_OtherSM_SRB8
657 MuTau_stat17_ST_SRB13
658 EleTau_stat16_ST_SRB12
659 EleTau_stat16_ST_SRB8
660 EleTau_stat17_OtherSM_SRB8
×10
−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 +0.15 −0.13
661 stat2018_fake_SRB14
662 MuTau_stat17_ST_SRB10
663 stat2018_TT_SRB14
664 MuTau_stat18_OtherSM_SRB7
665 MuTau_stat18_OtherSM_SRB15
666 stat2018_otherSM_SRB13
667 MuTau_stat16_TT_SRB15
668 EleTau_stat18_ST_SRB14
669 MuTau_stat16_ST_SRB2
670 EleTau_stat16_OtherSM_SRB10
671 EleTau_stat16_OtherSM_SRB13
672 EleTau_stat16_OtherSM_SRB9
673 EleTau_stat18_OtherSM_SRB10
674 EleTau_stat16_ST_SRB14
675 stat2018_otherSM_SRB14
676 MuTau_stat16_OtherSM_SRB15
677 EleTau_stat16_OtherSM_SRB15
678 EleTau_stat16_OtherSM_SRB14
679 MuTau_stat16_Fake_SRB15
680 EleTau_stat16_ST_SRB10
681 MuTau_stat17_OtherSM_SRB14
682 EleTau_stat16_Fake_SRB14
683 stat2017_otherSM_SRB15
684 stat2016_otherSM_SRB15
685 MuTau_stat16_ST_SRB13
686 MuTau_stat17_ST_SRB9
687 stat2017_otherSM_SRB14
688 MuTau_stat17_OtherSM_SRB15
689 MuTau_stat16_OtherSM_SRB11
690 MuTau_stat16_OtherSM_SRB13
−2 −1 0 1 2
−0.04 −0.02 0 0.02 0.04
×10
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
691 MuTau_stat18_OtherSM_SRB10
692 EleTau_stat18_OtherSM_SRB15
693 EleTau_stat17_ST_SRB14
694 EleTau_stat17_OtherSM_SRB15
695 stat2016_TT_SRB13
696 MuTau_stat17_OtherSM_SRB10
697 stat2016_sig_SRB15
698 stat2018_sig_SRB14
699 EleTau_stat16_ST_SRB13
700 MuTau_stat16_ST_SRB15
701 EleTau_stat17_OtherSM_SRB12
702 EleTau_stat18_ST_SRB10
703 EleTau_stat16_ST_SRB6
704 EleTau_stat17_OtherSM_SRB14
705 EleTau_stat17_OtherSM_SRB10
706 EleTau_stat17_OtherSM_SRB9
707 MuTau_stat16_ST_SRB14
708 EleTau_stat18_ST_SRB15
709 EleTau_stat16_ST_SRB15
710 MuTau_stat16_OtherSM_SRB14
711 stat2016_otherSM_SRB13
712 MuTau_stat16_OtherSM_SRB10
713 MuTau_stat16_OtherSM_SRB9
714 EleTau_stat18_TT_SRB15
715 EleTau_stat16_OtherSM_SRB11
716 EleTau_stat16_OtherSM_SRB12
717 MuTau_stat17_ST_SRB14
718 MuTau_stat16_OtherSM_SRB12
719 EleTau_stat16_TT_SRB15
720 EleTau_stat16_OtherSM_SRB6
−2
−1
0
1
2
−0.02
0
0.02
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 1.00 +0.15 −0.13
721
EleTau_stat17_ST_SRB13
−2
−1
0
1
2
−5
0
5
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂