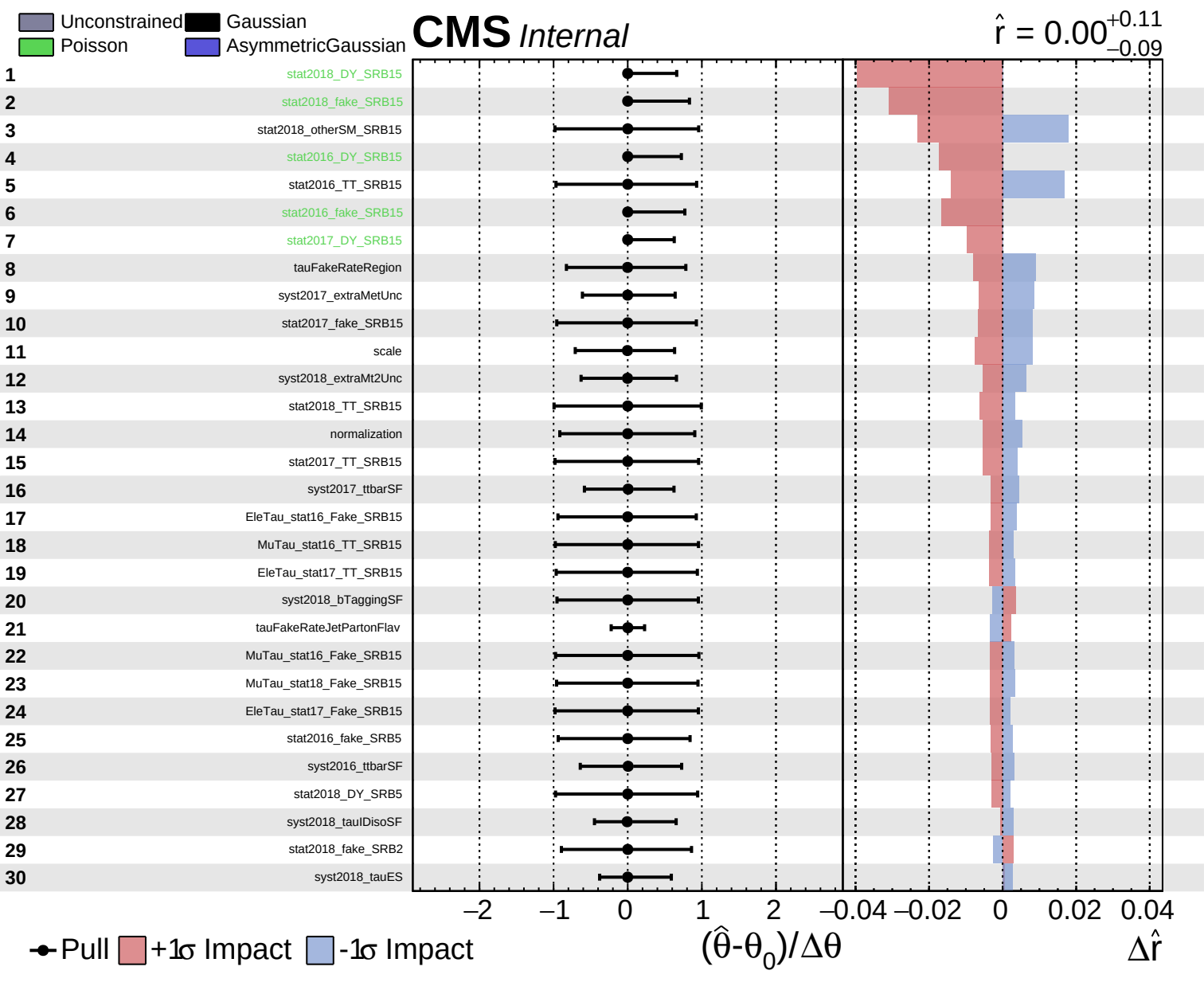
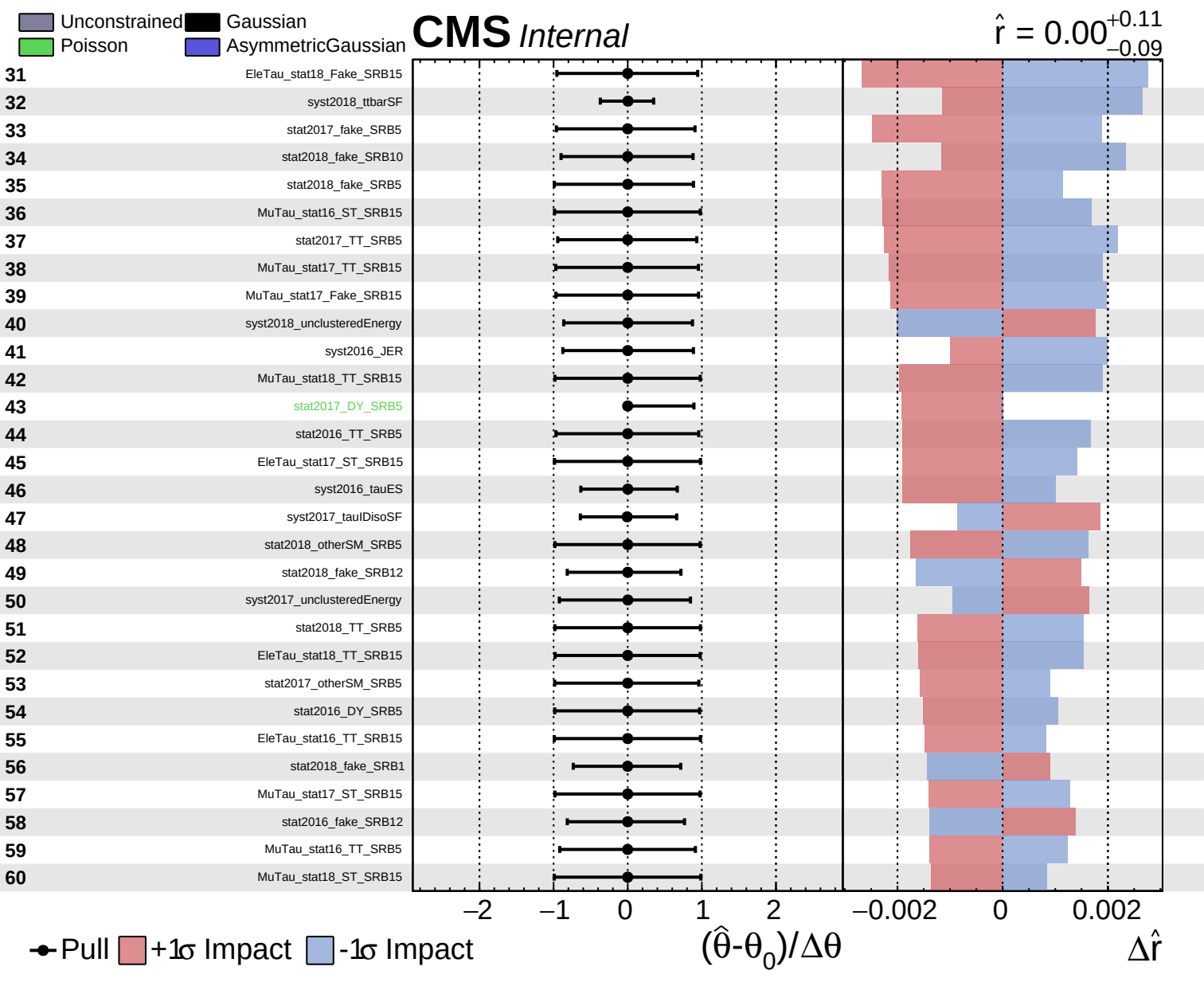

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
1 stat2018_DY_SRB15
2 stat2018_fake_SRB15
3 stat2018_otherSM_SRB15
4 stat2016_DY_SRB15
5 stat2016_TT_SRB15
6 stat2016_fake_SRB15
7 stat2017_DY_SRB15
8 tauFakeRateRegion
9 syst2017_extraMetUnc
10 stat2017_fake_SRB15
11 scale
12 syst2018_extraMt2Unc
13 stat2018_TT_SRB15
14 normalization
15 stat2017_TT_SRB15
16 syst2017_ttbarSF
17 EleTau_stat16_Fake_SRB15
18 MuTau_stat16_TT_SRB15
19 EleTau_stat17_TT_SRB15
20 syst2018_bTaggingSF
21 tauFakeRateJetPartonFlav
22 MuTau_stat16_Fake_SRB15
23 MuTau_stat18_Fake_SRB15
24 EleTau_stat17_Fake_SRB15
25 stat2016_fake_SRB5
26 syst2016_ttbarSF
27 stat2018_DY_SRB5
28 syst2018_tauIDisoSF
29 stat2018_fake_SRB2
30 syst2018_tauES
−2 −1 0 1 2
−0.04 −0.02 0 0.02 0.04
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂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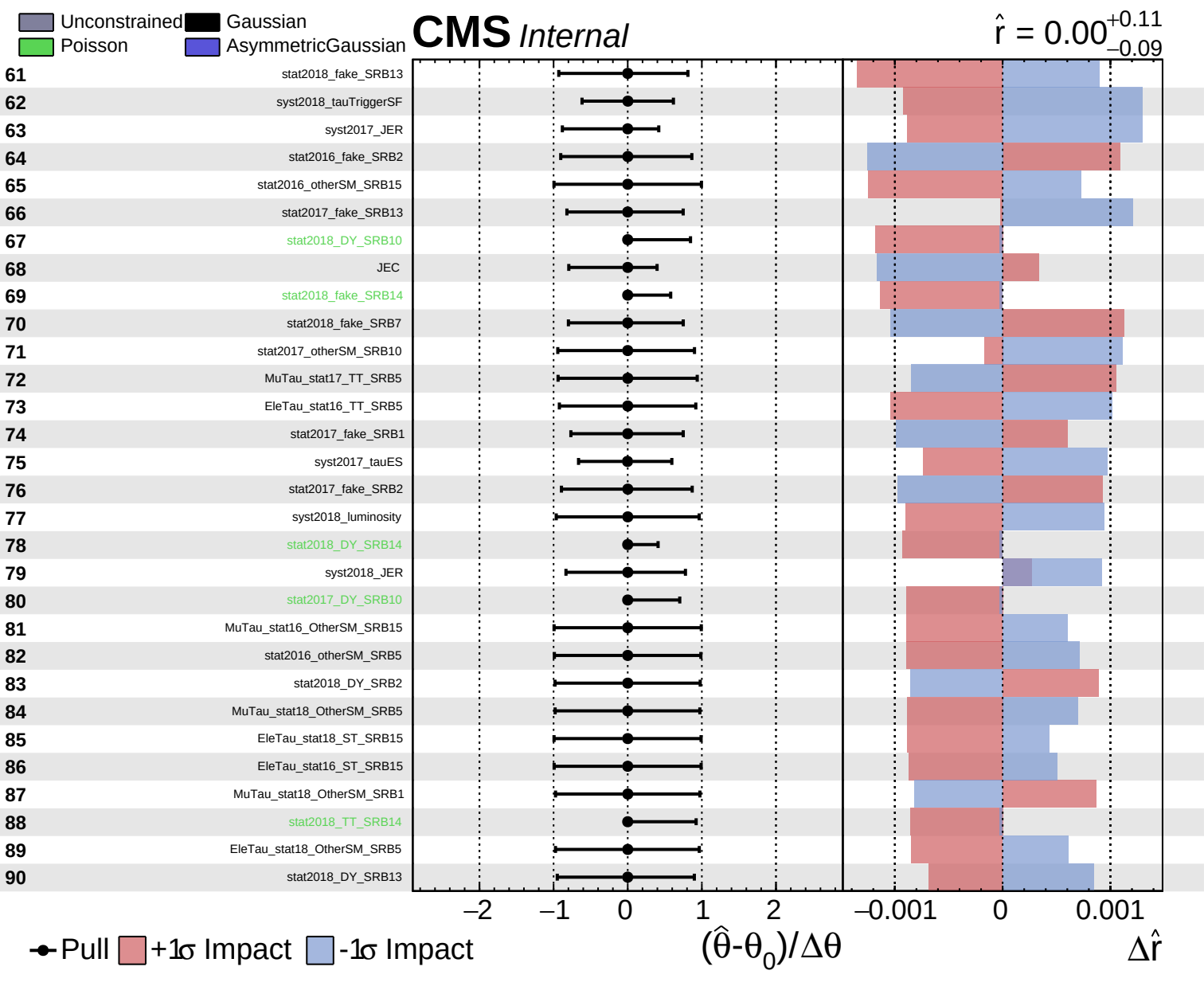
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
31 EleTau_stat18_Fake_SRB15
32 syst2018_ttbarSF
33 stat2017_fake_SRB5
34 stat2018_fake_SRB10
35 stat2018_fake_SRB5
36 MuTau_stat16_ST_SRB15
37 stat2017_TT_SRB5
38 MuTau_stat17_TT_SRB15
39 MuTau_stat17_Fake_SRB15
40 syst2018_unclusteredEnergy
41 syst2016_JER
42 MuTau_stat18_TT_SRB15
43 stat2017_DY_SRB5
44 stat2016_TT_SRB5
45 EleTau_stat17_ST_SRB15
46 syst2016_tauES
47 syst2017_tauIDisoSF
48 stat2018_otherSM_SRB5
49 stat2018_fake_SRB12
50 syst2017_unclusteredEnergy
51 stat2018_TT_SRB5
52 EleTau_stat18_TT_SRB15
53 stat2017_otherSM_SRB5
54 stat2016_DY_SRB5
55 EleTau_stat16_TT_SRB15
56 stat2018_fake_SRB1
57 MuTau_stat17_ST_SRB15
58 stat2016_fake_SRB12
59 MuTau_stat16_TT_SRB5
60 MuTau_stat18_ST_SRB15
−2 −1 0 1 2
−0.002 0 0.002
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂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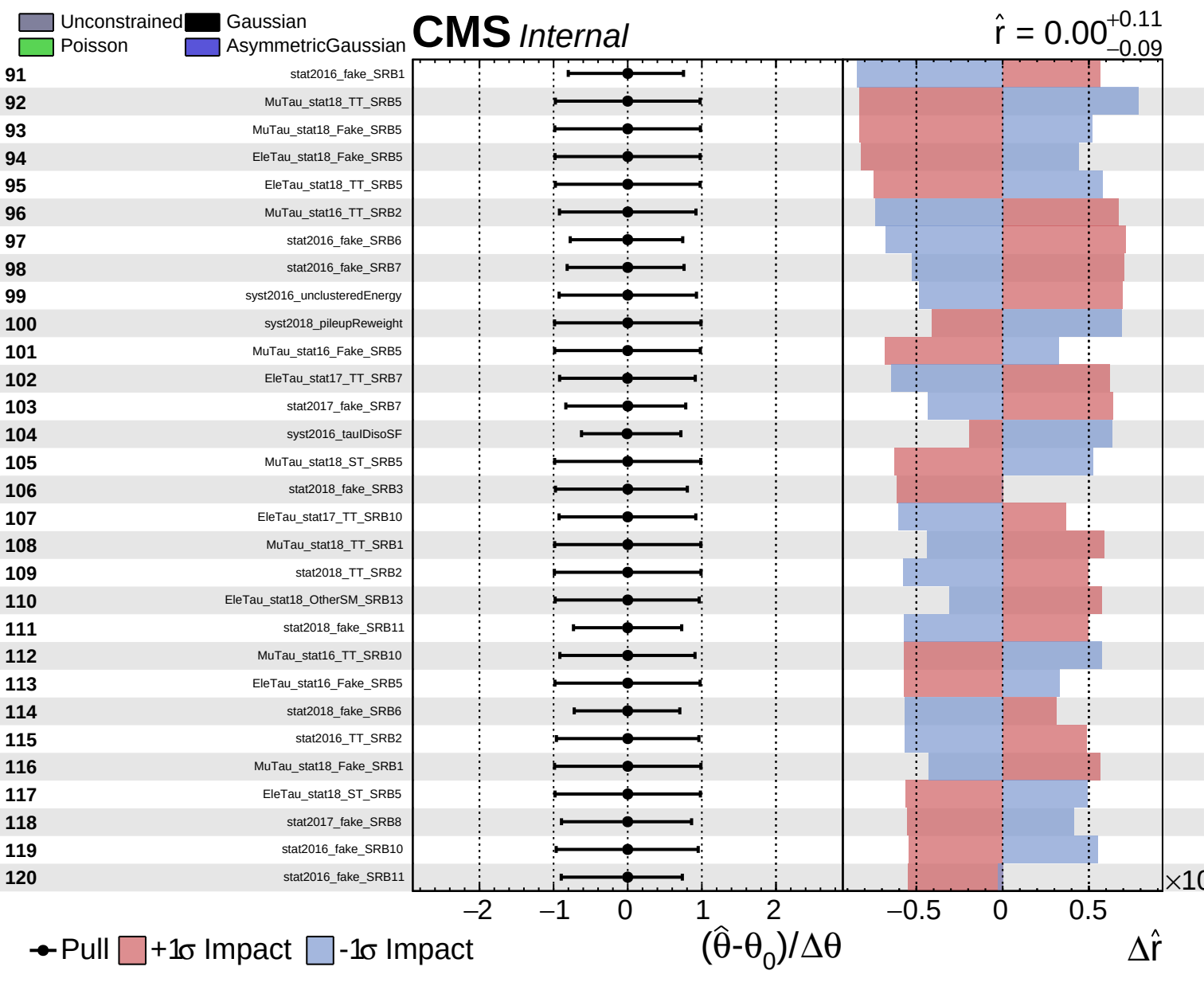
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
61 stat2018_fake_SRB13
62 syst2018_tauTriggerSF
63 syst2017_JER
64 stat2016_fake_SRB2
65 stat2016_otherSM_SRB15
66 stat2017_fake_SRB13
67 stat2018_DY_SRB10
68 JEC
69 stat2018_fake_SRB14
70 stat2018_fake_SRB7
71 stat2017_otherSM_SRB10
72 MuTau_stat17_TT_SRB5
73 EleTau_stat16_TT_SRB5
74 stat2017_fake_SRB1
75 syst2017_tauES
76 stat2017_fake_SRB2
77 syst2018_luminosity
78 stat2018_DY_SRB14
79 syst2018_JER
80 stat2017_DY_SRB10
81 MuTau_stat16_OtherSM_SRB15
82 stat2016_otherSM_SRB5
83 stat2018_DY_SRB2
84 MuTau_stat18_OtherSM_SRB5
85 EleTau_stat18_ST_SRB15
86 EleTau_stat16_ST_SRB15
87 MuTau_stat18_OtherSM_SRB1
88 stat2018_TT_SRB14
89 EleTau_stat18_OtherSM_SRB5
90 stat2018_DY_SRB13
−2 −1 0 1 2
−0.001 0 0.001
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂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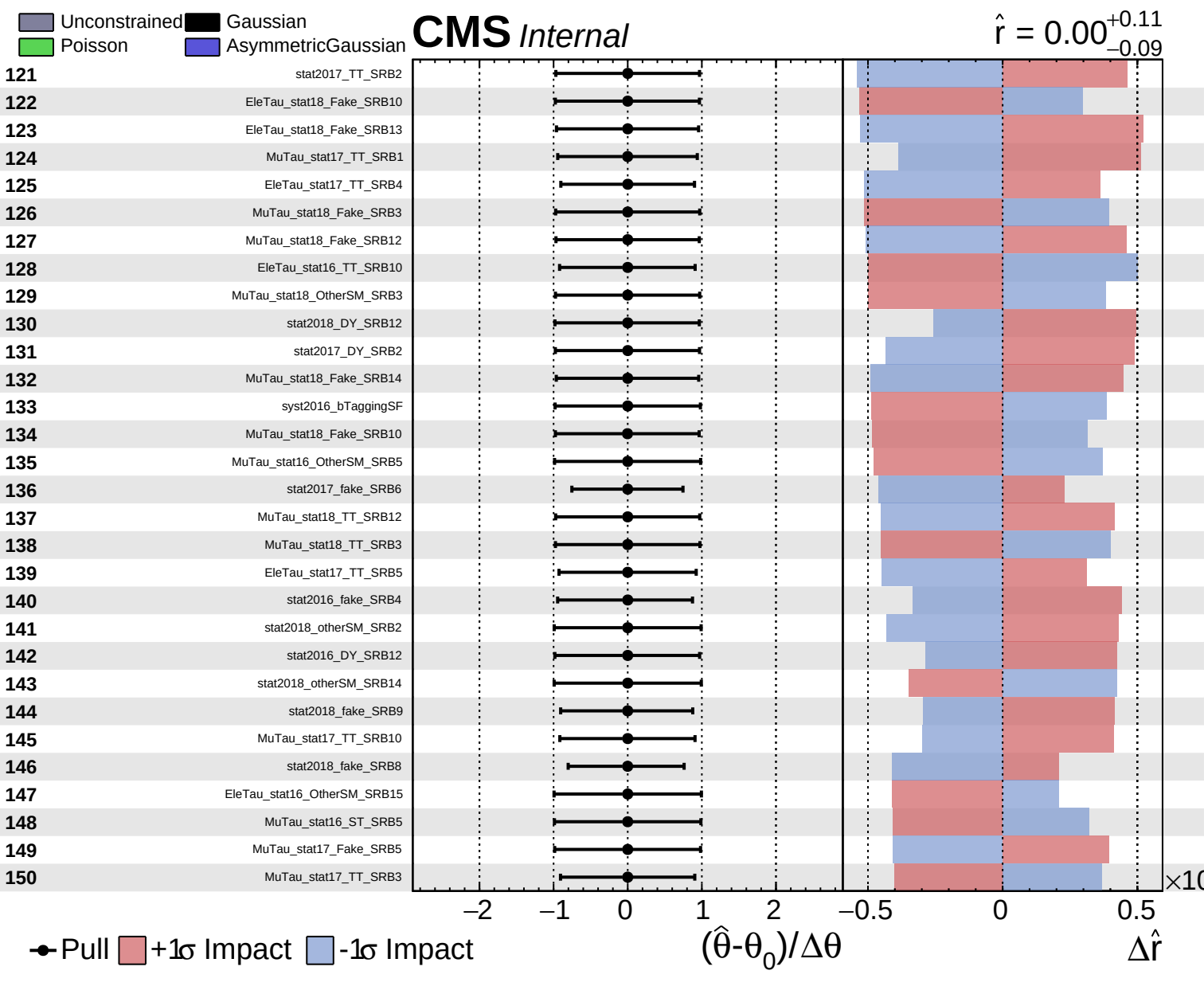
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
91 stat2016_fake_SRB1
92 MuTau_stat18_TT_SRB5
93 MuTau_stat18_Fake_SRB5
94 EleTau_stat18_Fake_SRB5
95 EleTau_stat18_TT_SRB5
96 MuTau_stat16_TT_SRB2
97 stat2016_fake_SRB6
98 stat2016_fake_SRB7
99 syst2016_unclusteredEnergy
100 syst2018_pileupReweight
101 MuTau_stat16_Fake_SRB5
102 EleTau_stat17_TT_SRB7
103 stat2017_fake_SRB7
104 syst2016_tauIDisoSF
105 MuTau_stat18_ST_SRB5
106 stat2018_fake_SRB3
107 EleTau_stat17_TT_SRB10
108 MuTau_stat18_TT_SRB1
109 stat2018_TT_SRB2
110 EleTau_stat18_OtherSM_SRB13
111 stat2018_fake_SRB11
112 MuTau_stat16_TT_SRB10
113 EleTau_stat16_Fake_SRB5
114 stat2018_fake_SRB6
115 stat2016_TT_SRB2
116 MuTau_stat18_Fake_SRB1
117 EleTau_stat18_ST_SRB5
118 stat2017_fake_SRB8
119 stat2016_fake_SRB10
120 stat2016_fake_SRB11
×10
−2 −1 0 1 2
−0.5 0 0.5
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂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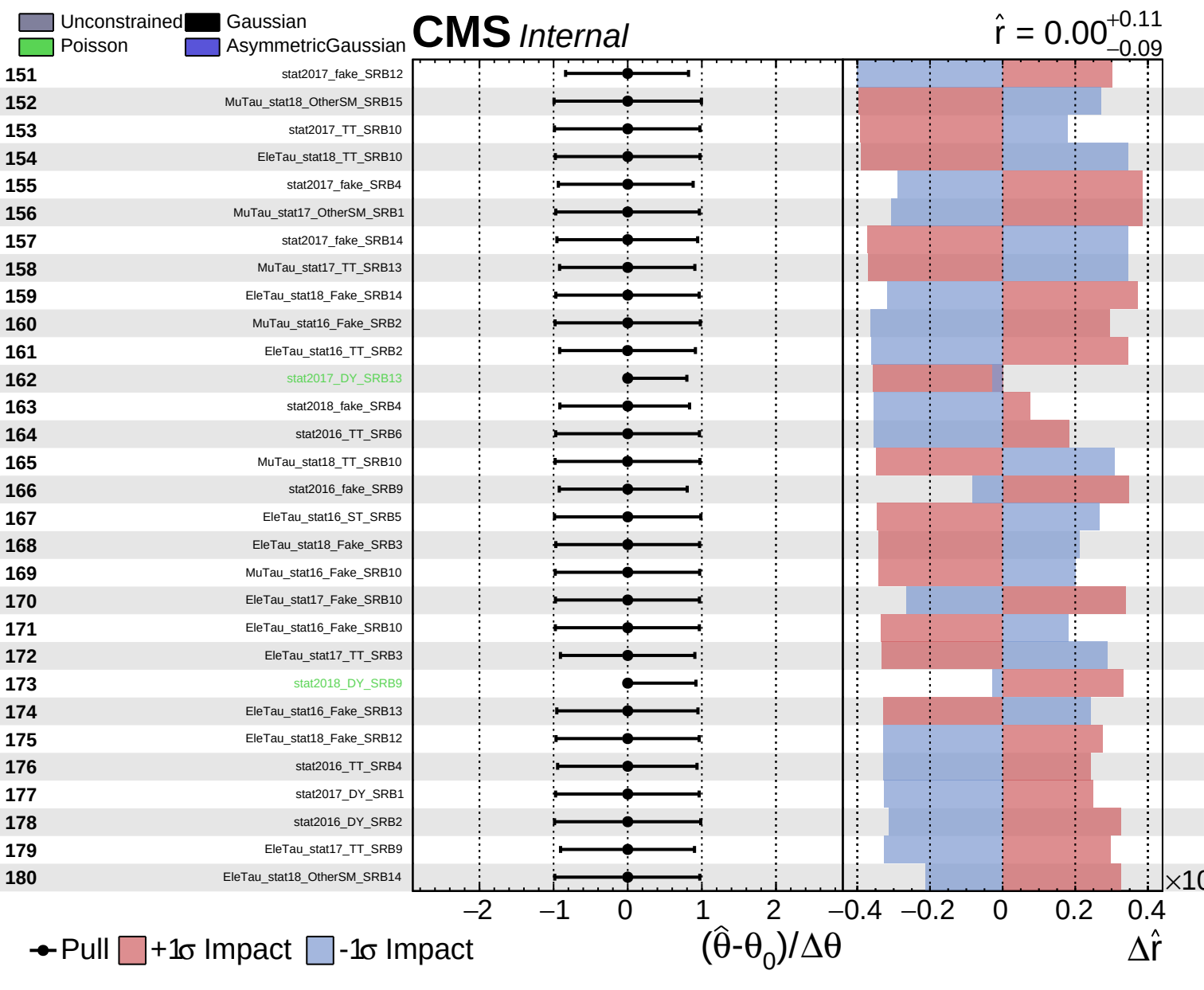
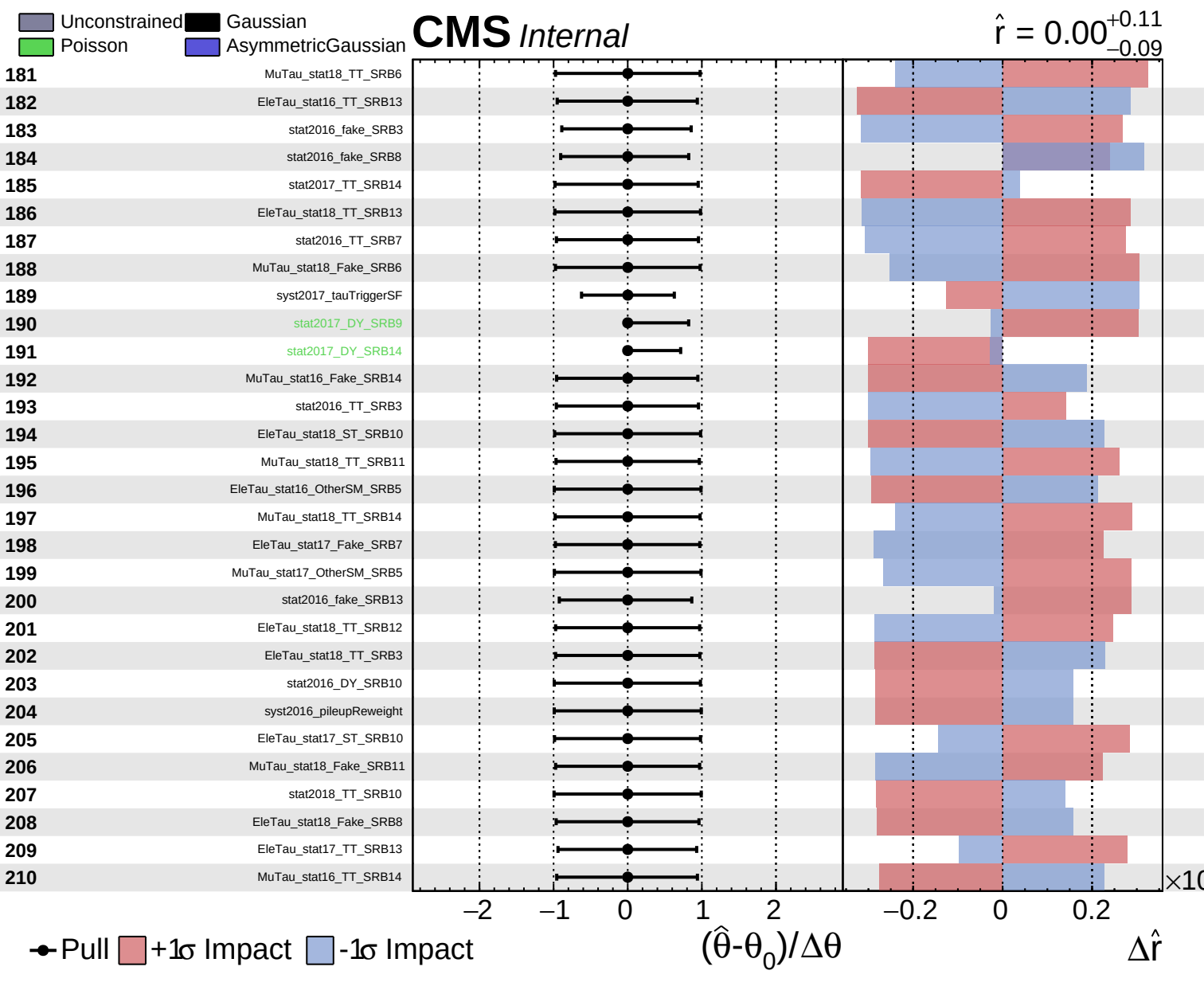
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
121 stat2017_TT_SRB2
122 EleTau_stat18_Fake_SRB10
123 EleTau_stat18_Fake_SRB13
124 MuTau_stat17_TT_SRB1
125 EleTau_stat17_TT_SRB4
126 MuTau_stat18_Fake_SRB3
127 MuTau_stat18_Fake_SRB12
128 EleTau_stat16_TT_SRB10
129 MuTau_stat18_OtherSM_SRB3
130 stat2018_DY_SRB12
131 stat2017_DY_SRB2
132 MuTau_stat18_Fake_SRB14
133 syst2016_bTaggingSF
134 MuTau_stat18_Fake_SRB10
135 MuTau_stat16_OtherSM_SRB5
136 stat2017_fake_SRB6
137 MuTau_stat18_TT_SRB12
138 MuTau_stat18_TT_SRB3
139 EleTau_stat17_TT_SRB5
140 stat2016_fake_SRB4
141 stat2018_otherSM_SRB2
142 stat2016_DY_SRB12
143 stat2018_otherSM_SRB14
144 stat2018_fake_SRB9
145 MuTau_stat17_TT_SRB10
146 stat2018_fake_SRB8
147 EleTau_stat16_OtherSM_SRB15
148 MuTau_stat16_ST_SRB5
149 MuTau_stat17_Fake_SRB5
150 MuTau_stat17_TT_SRB3
×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 = 0.00 +0.11 −0.09
151 stat2017_fake_SRB12
152 MuTau_stat18_OtherSM_SRB15
153 stat2017_TT_SRB10
154 EleTau_stat18_TT_SRB10
155 stat2017_fake_SRB4
156 MuTau_stat17_OtherSM_SRB1
157 stat2017_fake_SRB14
158 MuTau_stat17_TT_SRB13
159 EleTau_stat18_Fake_SRB14
160 MuTau_stat16_Fake_SRB2
161 EleTau_stat16_TT_SRB2
162 stat2017_DY_SRB13
163 stat2018_fake_SRB4
164 stat2016_TT_SRB6
165 MuTau_stat18_TT_SRB10
166 stat2016_fake_SRB9
167 EleTau_stat16_ST_SRB5
168 EleTau_stat18_Fake_SRB3
169 MuTau_stat16_Fake_SRB10
170 EleTau_stat17_Fake_SRB10
171 EleTau_stat16_Fake_SRB10
172 EleTau_stat17_TT_SRB3
173 stat2018_DY_SRB9
174 EleTau_stat16_Fake_SRB13
175 EleTau_stat18_Fake_SRB12
176 stat2016_TT_SRB4
177 stat2017_DY_SRB1
178 stat2016_DY_SRB2
179 EleTau_stat17_TT_SRB9
180 EleTau_stat18_OtherSM_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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Poisson
AsymmetricGaussian
CMS Internal
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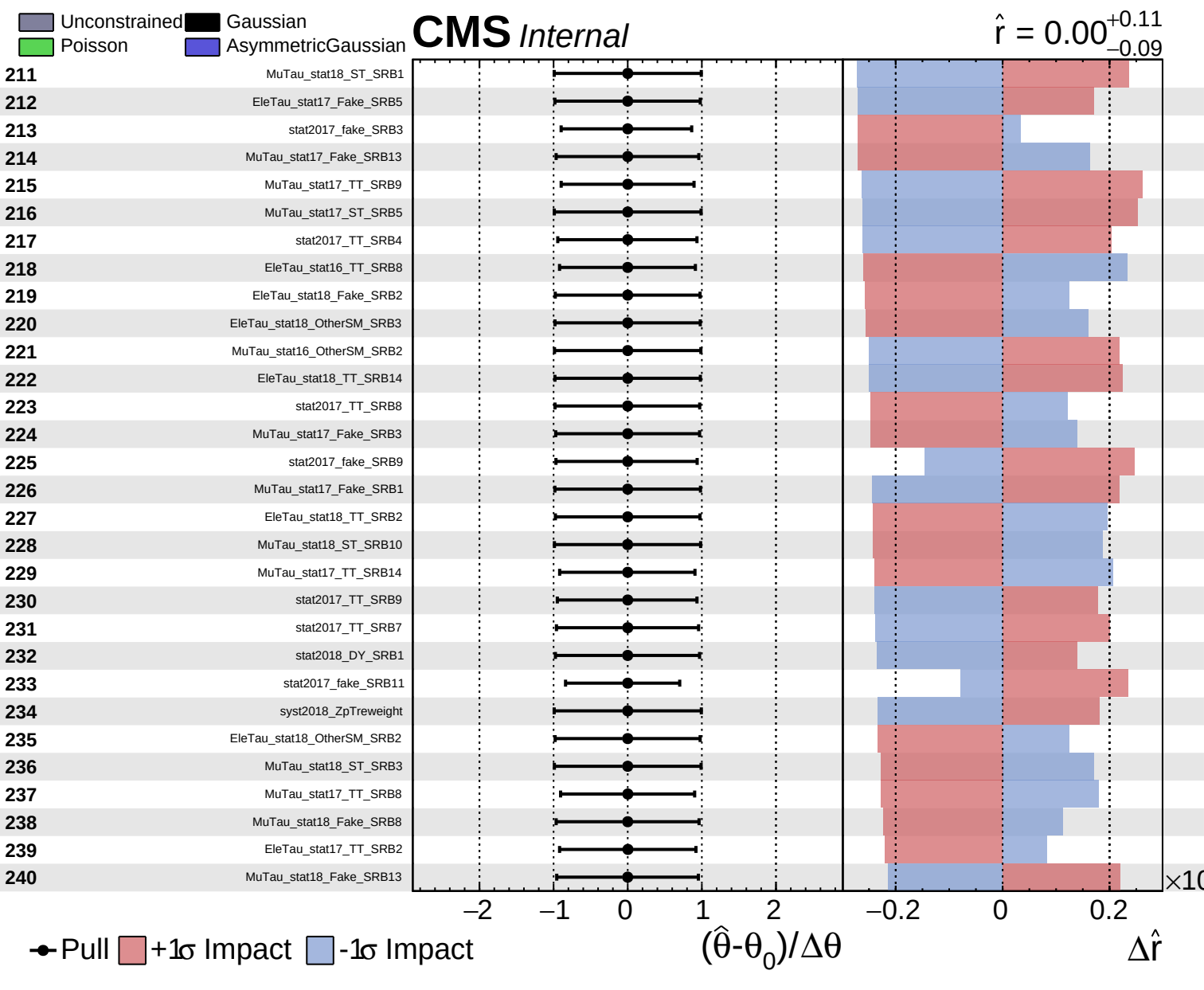
181 MuTau_stat18_TT_SRB6
182 EleTau_stat16_TT_SRB13
183 stat2016_fake_SRB3
184 stat2016_fake_SRB8
185 stat2017_TT_SRB14
186 EleTau_stat18_TT_SRB13
187 stat2016_TT_SRB7
188 MuTau_stat18_Fake_SRB6
189 syst2017_tauTriggerSF
190 stat2017_DY_SRB9
191 stat2017_DY_SRB14
192 MuTau_stat16_Fake_SRB14
193 stat2016_TT_SRB3
194 EleTau_stat18_ST_SRB10
195 MuTau_stat18_TT_SRB11
196 EleTau_stat16_OtherSM_SRB5
197 MuTau_stat18_TT_SRB14
198 EleTau_stat17_Fake_SRB7
199 MuTau_stat17_OtherSM_SRB5
200 stat2016_fake_SRB13
201 EleTau_stat18_TT_SRB12
202 EleTau_stat18_TT_SRB3
203 stat2016_DY_SRB10
204 syst2016_pileupReweight
205 EleTau_stat17_ST_SRB10
206 MuTau_stat18_Fake_SRB11
207 stat2018_TT_SRB10
208 EleTau_stat18_Fake_SRB8
209 EleTau_stat17_TT_SRB13
210 MuTau_stat16_TT_SRB14
−2 −1 0 1 2
−0.2 0 0.2
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂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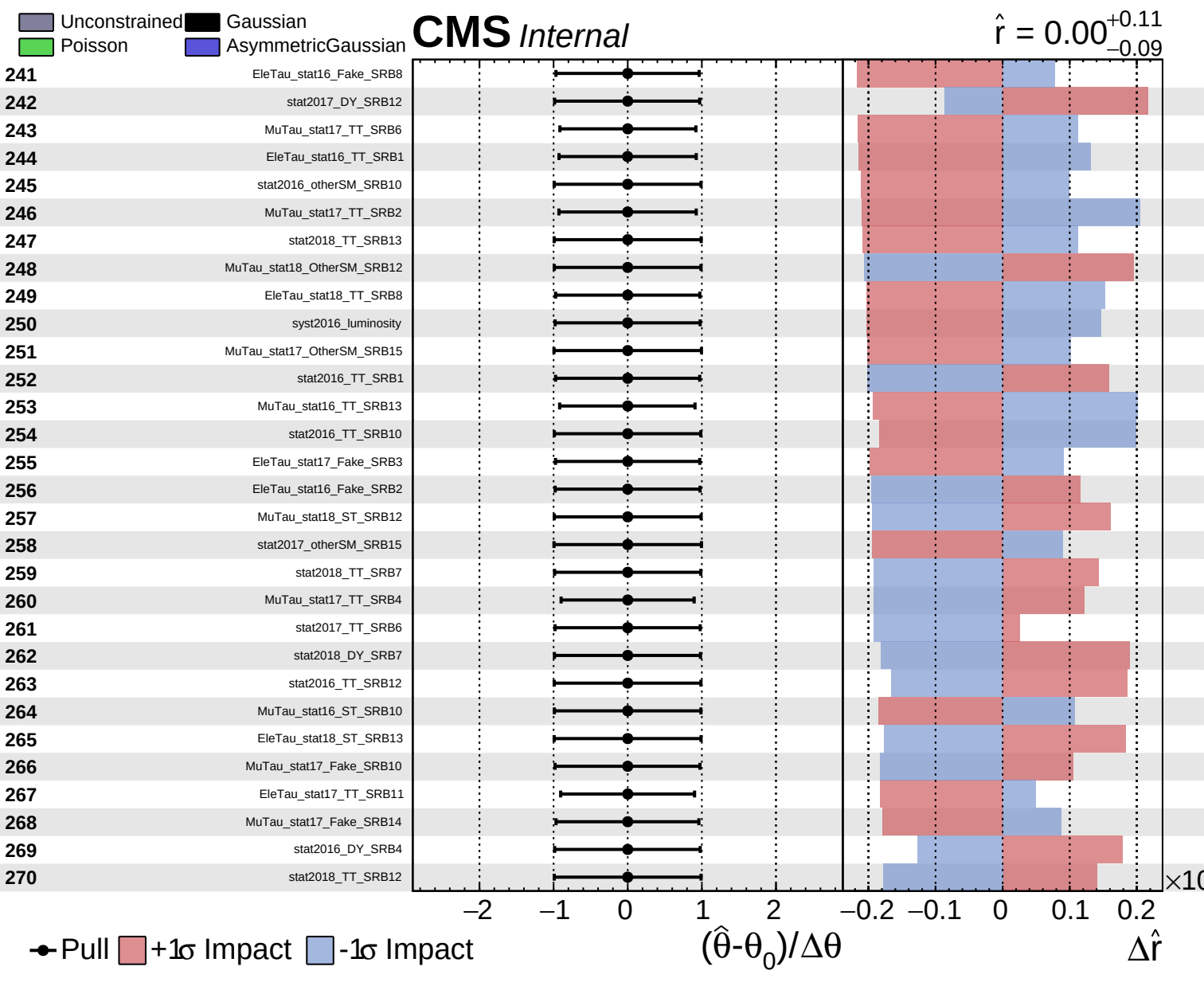
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
211 MuTau_stat18_ST_SRB1
212 EleTau_stat17_Fake_SRB5
213 stat2017_fake_SRB3
214 MuTau_stat17_Fake_SRB13
215 MuTau_stat17_TT_SRB9
216 MuTau_stat17_ST_SRB5
217 stat2017_TT_SRB4
218 EleTau_stat16_TT_SRB8
219 EleTau_stat18_Fake_SRB2
220 EleTau_stat18_OtherSM_SRB3
221 MuTau_stat16_OtherSM_SRB2
222 EleTau_stat18_TT_SRB14
223 stat2017_TT_SRB8
224 MuTau_stat17_Fake_SRB3
225 stat2017_fake_SRB9
226 MuTau_stat17_Fake_SRB1
227 EleTau_stat18_TT_SRB2
228 MuTau_stat18_ST_SRB10
229 MuTau_stat17_TT_SRB14
230 stat2017_TT_SRB9
231 stat2017_TT_SRB7
232 stat2018_DY_SRB1
233 stat2017_fake_SRB11
234 syst2018_ZpTreweight
235 EleTau_stat18_OtherSM_SRB2
236 MuTau_stat18_ST_SRB3
237 MuTau_stat17_TT_SRB8
238 MuTau_stat18_Fake_SRB8
239 EleTau_stat17_TT_SRB2
240 MuTau_stat18_Fake_SRB13
−2 −1 0 1 2
−0.2 0 0.2
×10
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂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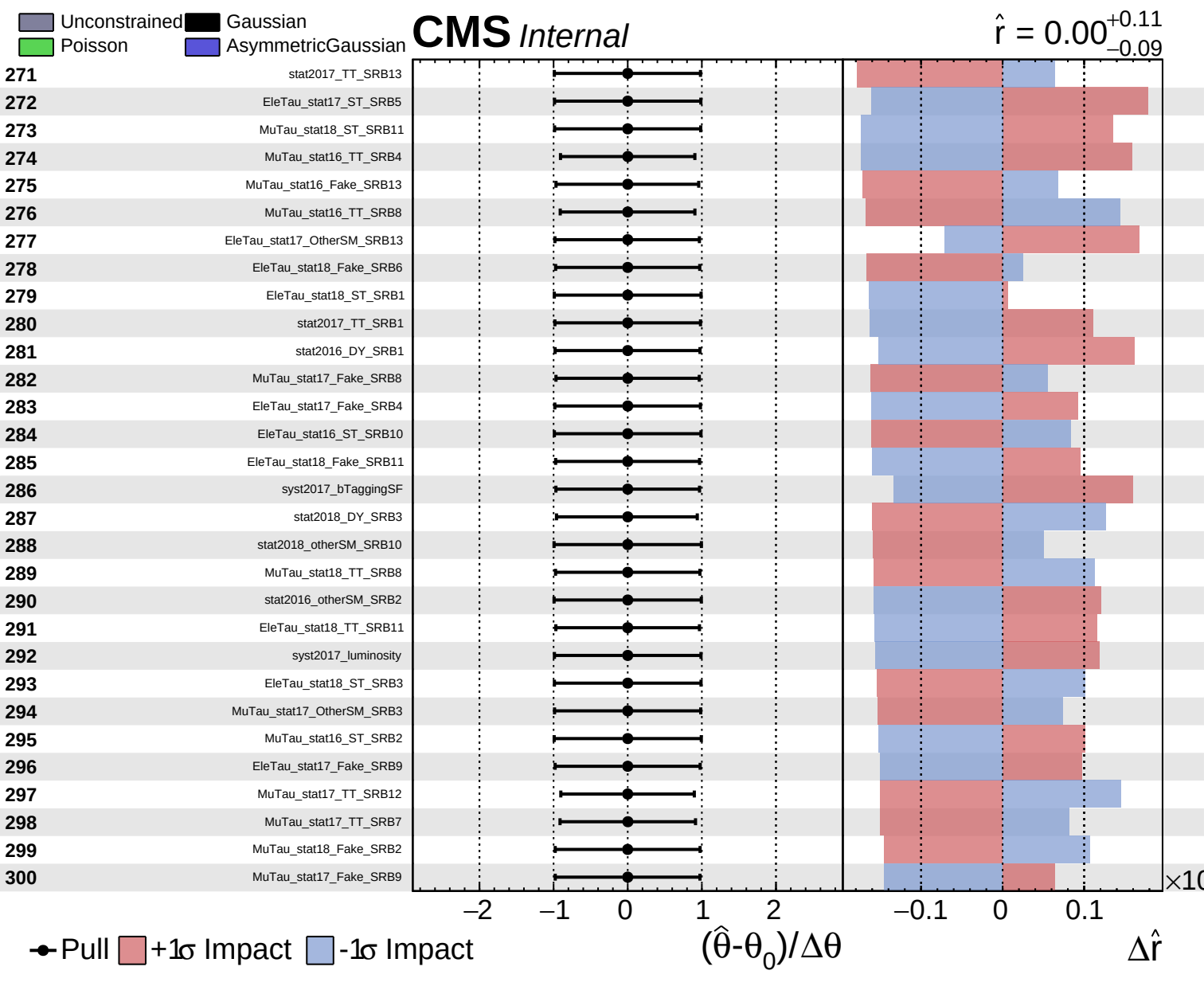
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
241 EleTau_stat16_Fake_SRB8
242 stat2017_DY_SRB12
243 MuTau_stat17_TT_SRB6
244 EleTau_stat16_TT_SRB1
245 stat2016_otherSM_SRB10
246 MuTau_stat17_TT_SRB2
247 stat2018_TT_SRB13
248 MuTau_stat18_OtherSM_SRB12
249 EleTau_stat18_TT_SRB8
250 syst2016_luminosity
251 MuTau_stat17_OtherSM_SRB15
252 stat2016_TT_SRB1
253 MuTau_stat16_TT_SRB13
254 stat2016_TT_SRB10
255 EleTau_stat17_Fake_SRB3
256 EleTau_stat16_Fake_SRB2
257 MuTau_stat18_ST_SRB12
258 stat2017_otherSM_SRB15
259 stat2018_TT_SRB7
260 MuTau_stat17_TT_SRB4
261 stat2017_TT_SRB6
262 stat2018_DY_SRB7
263 stat2016_TT_SRB12
264 MuTau_stat16_ST_SRB10
265 EleTau_stat18_ST_SRB13
266 MuTau_stat17_Fake_SRB10
267 EleTau_stat17_TT_SRB11
268 MuTau_stat17_Fake_SRB14
269 stat2016_DY_SRB4
270 stat2018_TT_SRB12
×10
−2 −1 0 1 2
−0.2 −0.1 0 0.1 0.2
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂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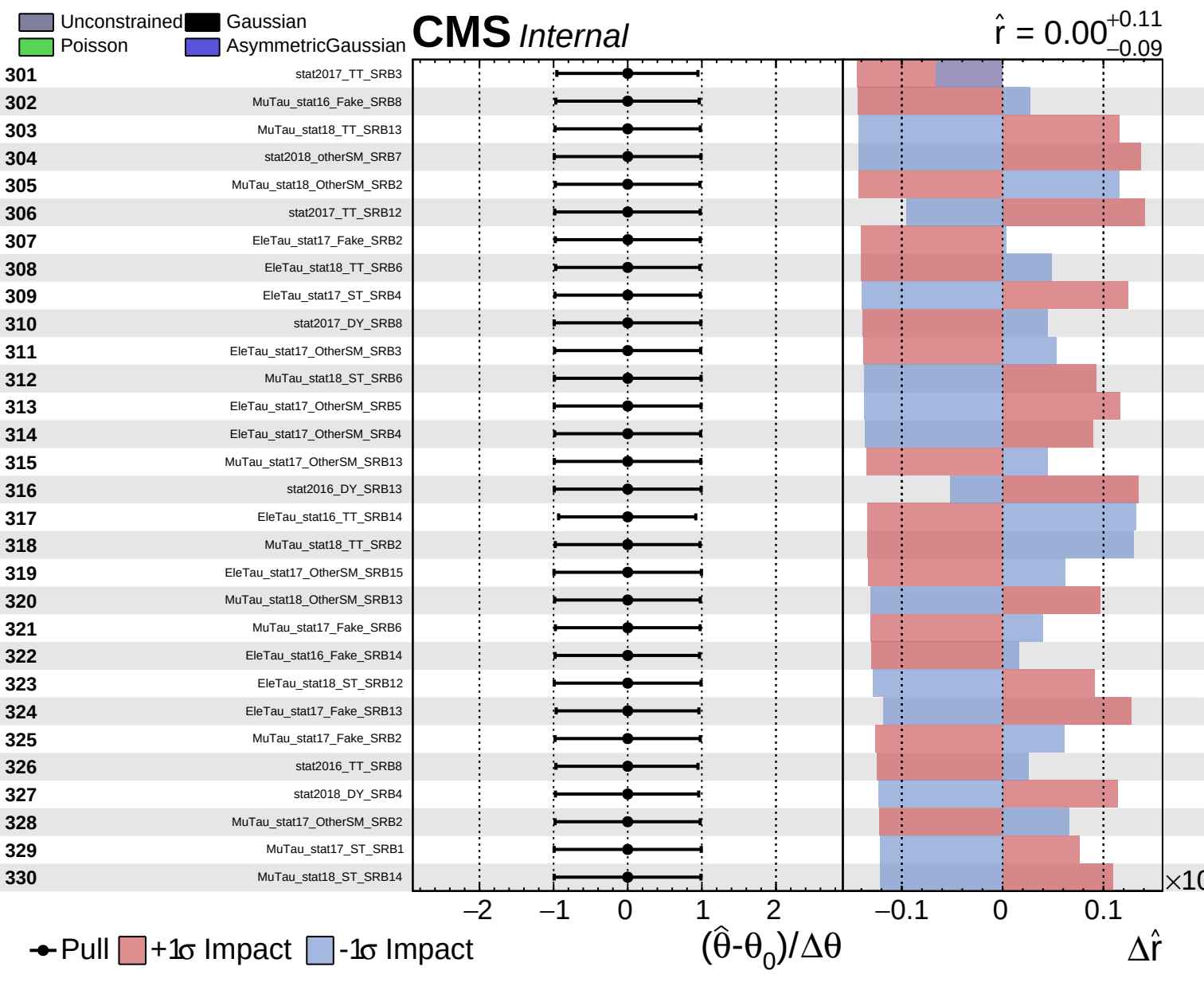
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
271 stat2017_TT_SRB13
272 EleTau_stat17_ST_SRB5
273 MuTau_stat18_ST_SRB11
274 MuTau_stat16_TT_SRB4
275 MuTau_stat16_Fake_SRB13
276 MuTau_stat16_TT_SRB8
277 EleTau_stat17_OtherSM_SRB13
278 EleTau_stat18_Fake_SRB6
279 EleTau_stat18_ST_SRB1
280 stat2017_TT_SRB1
281 stat2016_DY_SRB1
282 MuTau_stat17_Fake_SRB8
283 EleTau_stat17_Fake_SRB4
284 EleTau_stat16_ST_SRB10
285 EleTau_stat18_Fake_SRB11
286 syst2017_bTaggingSF
287 stat2018_DY_SRB3
288 stat2018_otherSM_SRB10
289 MuTau_stat18_TT_SRB8
290 stat2016_otherSM_SRB2
291 EleTau_stat18_TT_SRB11
292 syst2017_luminosity
293 EleTau_stat18_ST_SRB3
294 MuTau_stat17_OtherSM_SRB3
295 MuTau_stat16_ST_SRB2
296 EleTau_stat17_Fake_SRB9
297 MuTau_stat17_TT_SRB12
298 MuTau_stat17_TT_SRB7
299 MuTau_stat18_Fake_SRB2
300 MuTau_stat17_Fake_SRB9
−2 −1 0 1 2
−0.1 0 0.1
×10
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂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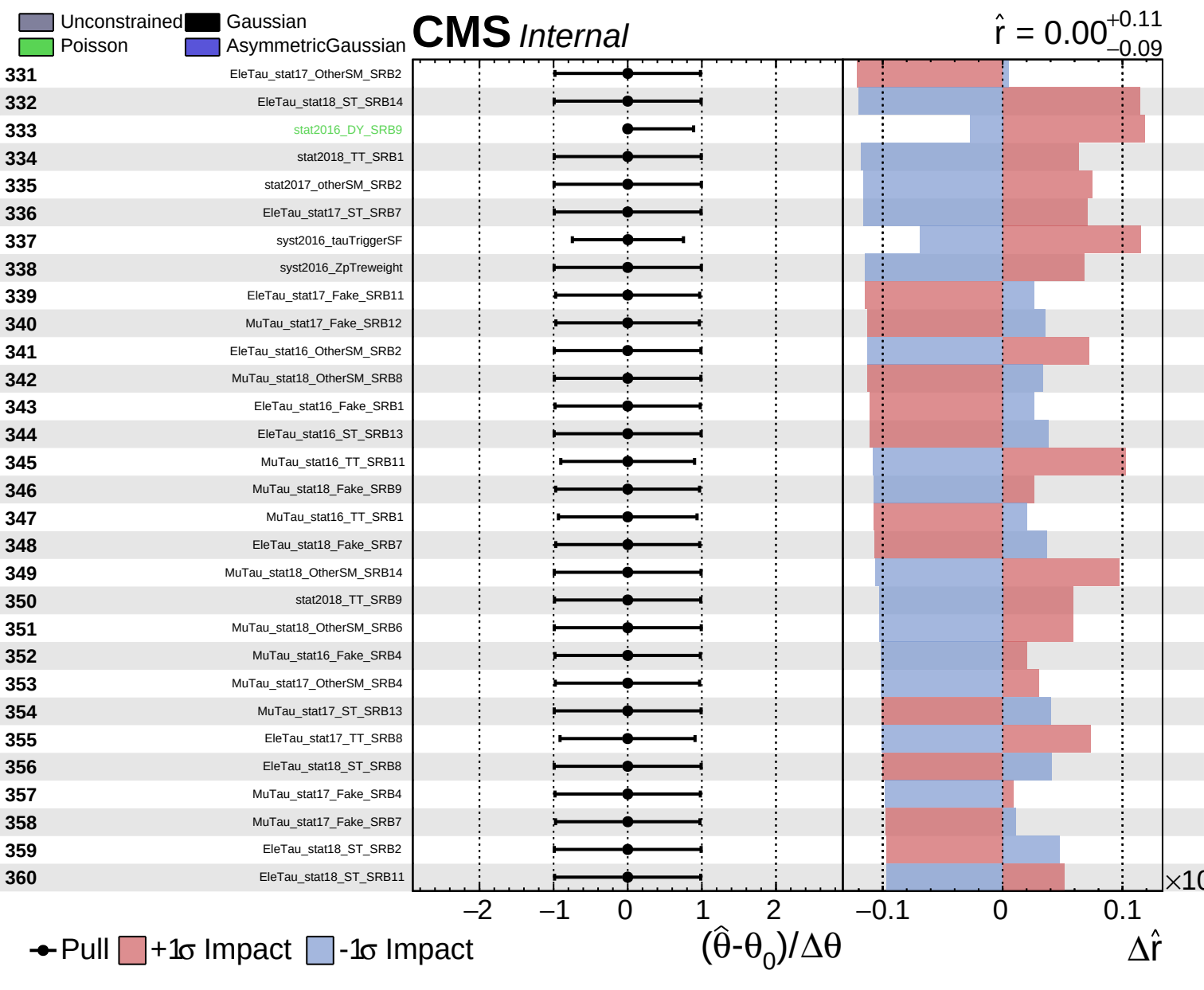
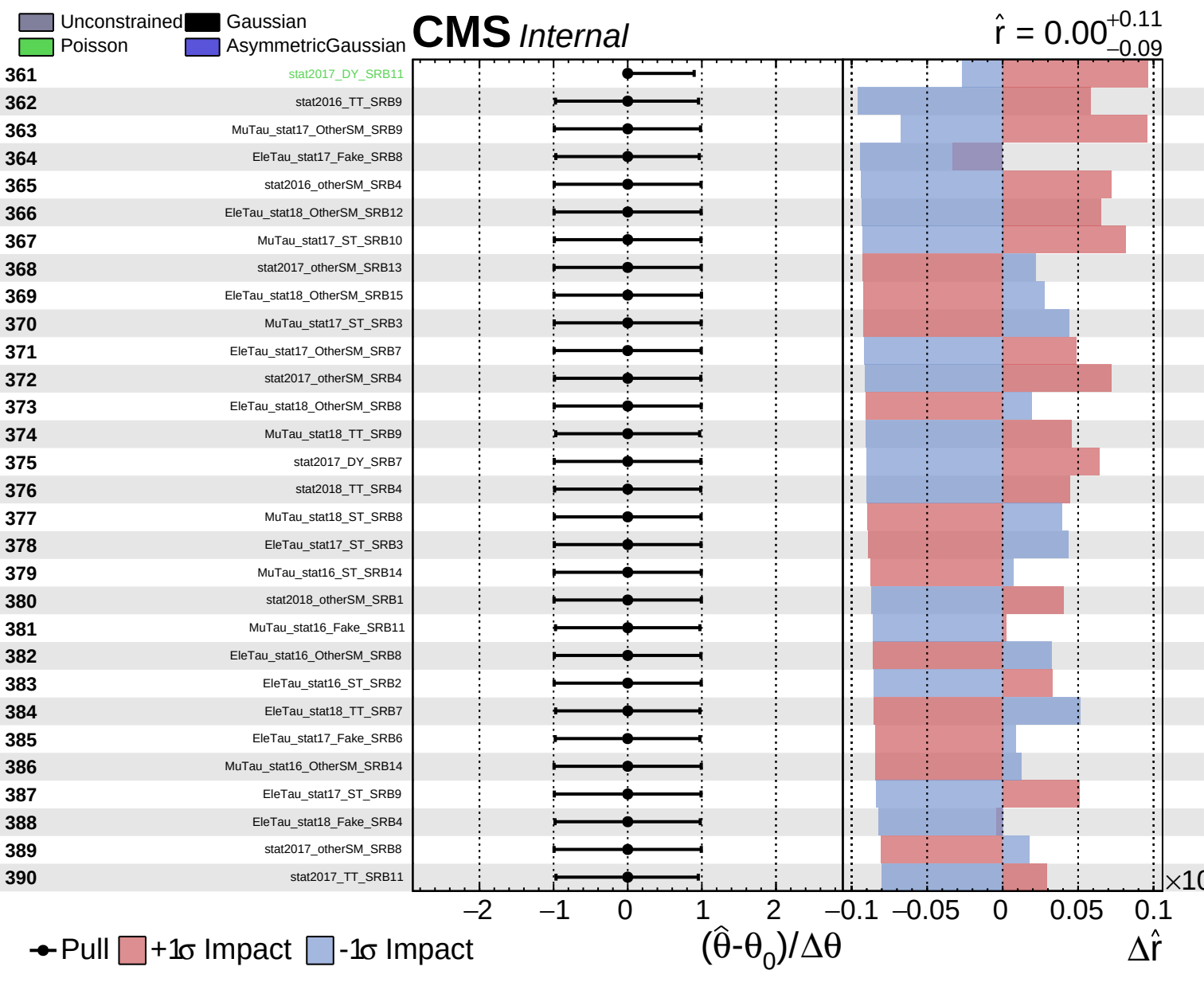
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
301 stat2017_TT_SRB3
302 MuTau_stat16_Fake_SRB8
303 MuTau_stat18_TT_SRB13
304 stat2018_otherSM_SRB7
305 MuTau_stat18_OtherSM_SRB2
306 stat2017_TT_SRB12
307 EleTau_stat17_Fake_SRB2
308 EleTau_stat18_TT_SRB6
309 EleTau_stat17_ST_SRB4
310 stat2017_DY_SRB8
311 EleTau_stat17_OtherSM_SRB3
312 MuTau_stat18_ST_SRB6
313 EleTau_stat17_OtherSM_SRB5
314 EleTau_stat17_OtherSM_SRB4
315 MuTau_stat17_OtherSM_SRB13
316 stat2016_DY_SRB13
317 EleTau_stat16_TT_SRB14
318 MuTau_stat18_TT_SRB2
319 EleTau_stat17_OtherSM_SRB15
320 MuTau_stat18_OtherSM_SRB13
321 MuTau_stat17_Fake_SRB6
322 EleTau_stat16_Fake_SRB14
323 EleTau_stat18_ST_SRB12
324 EleTau_stat17_Fake_SRB13
325 MuTau_stat17_Fake_SRB2
326 stat2016_TT_SRB8
327 stat2018_DY_SRB4
328 MuTau_stat17_OtherSM_SRB2
329 MuTau_stat17_ST_SRB1
330 MuTau_stat18_ST_SRB14
×10
−2 −1 0 1 2
−0.1 0 0.1
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
331 EleTau_stat17_OtherSM_SRB2
332 EleTau_stat18_ST_SRB14
333 stat2016_DY_SRB9
334 stat2018_TT_SRB1
335 stat2017_otherSM_SRB2
336 EleTau_stat17_ST_SRB7
337 syst2016_tauTriggerSF
338 syst2016_ZpTreweight
339 EleTau_stat17_Fake_SRB11
340 MuTau_stat17_Fake_SRB12
341 EleTau_stat16_OtherSM_SRB2
342 MuTau_stat18_OtherSM_SRB8
343 EleTau_stat16_Fake_SRB1
344 EleTau_stat16_ST_SRB13
345 MuTau_stat16_TT_SRB11
346 MuTau_stat18_Fake_SRB9
347 MuTau_stat16_TT_SRB1
348 EleTau_stat18_Fake_SRB7
349 MuTau_stat18_OtherSM_SRB14
350 stat2018_TT_SRB9
351 MuTau_stat18_OtherSM_SRB6
352 MuTau_stat16_Fake_SRB4
353 MuTau_stat17_OtherSM_SRB4
354 MuTau_stat17_ST_SRB13
355 EleTau_stat17_TT_SRB8
356 EleTau_stat18_ST_SRB8
357 MuTau_stat17_Fake_SRB4
358 MuTau_stat17_Fake_SRB7
359 EleTau_stat18_ST_SRB2
360 EleTau_stat18_ST_SRB11
−2
−1
0
1
2
−0.1
0
0.1
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂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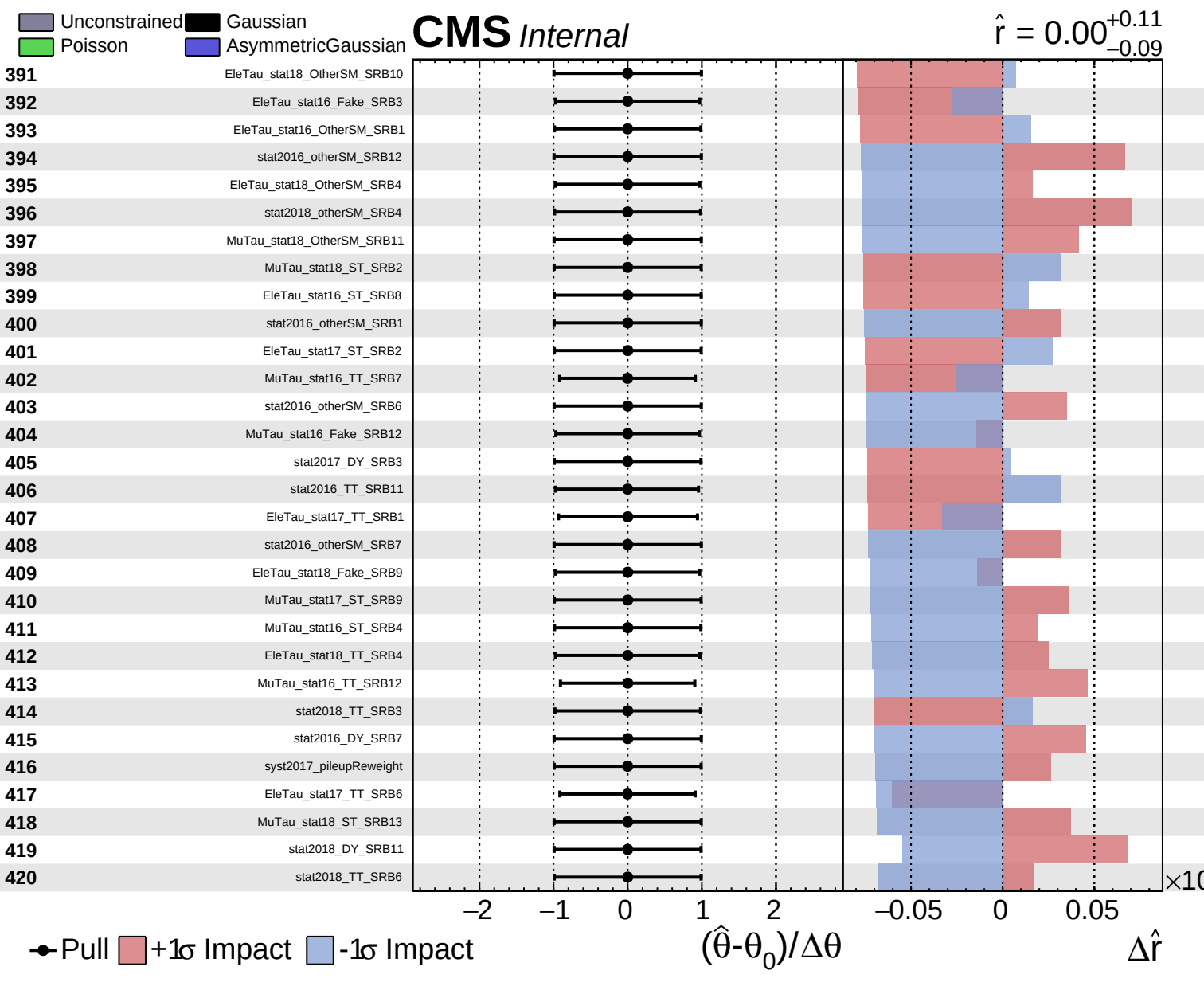
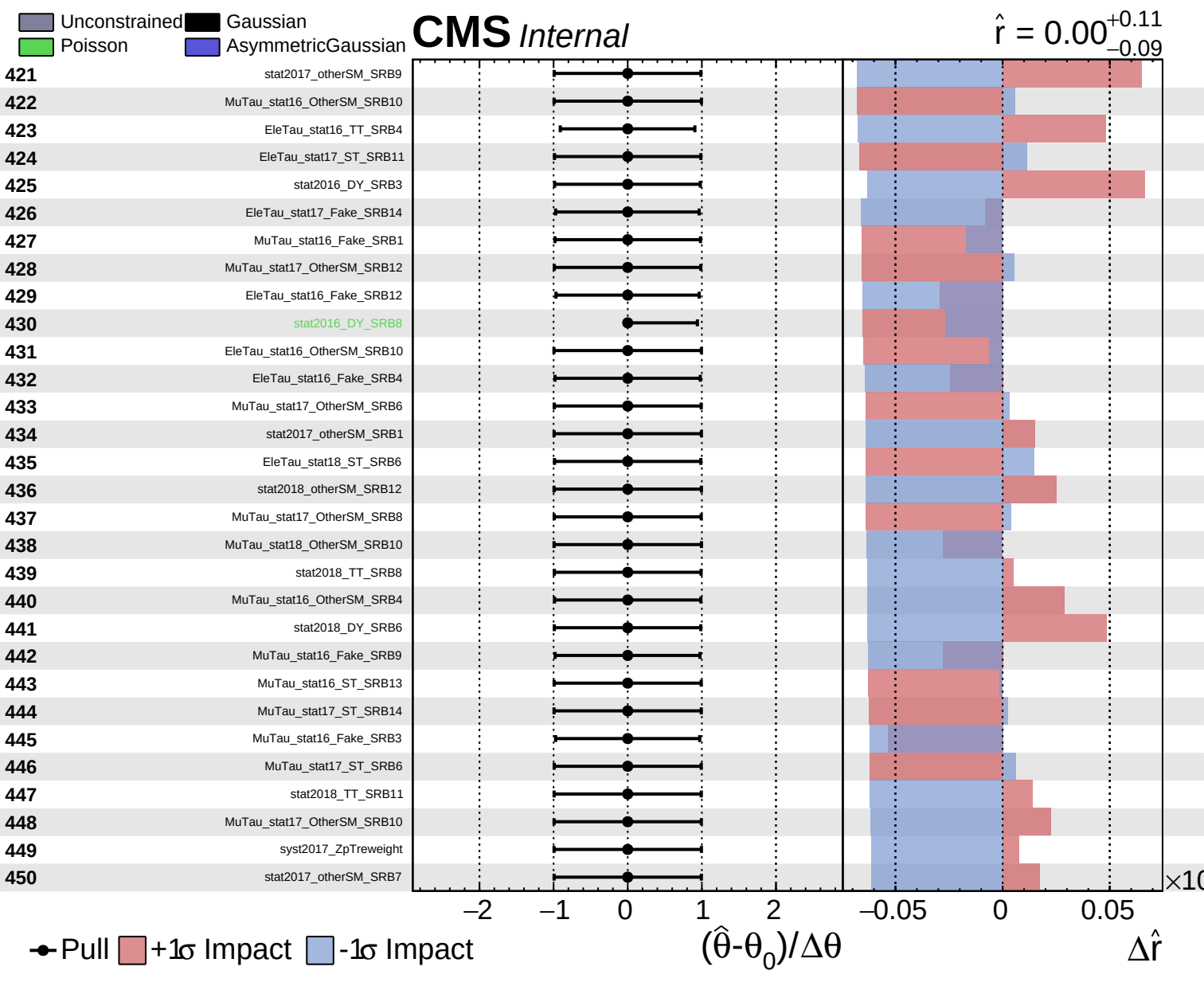
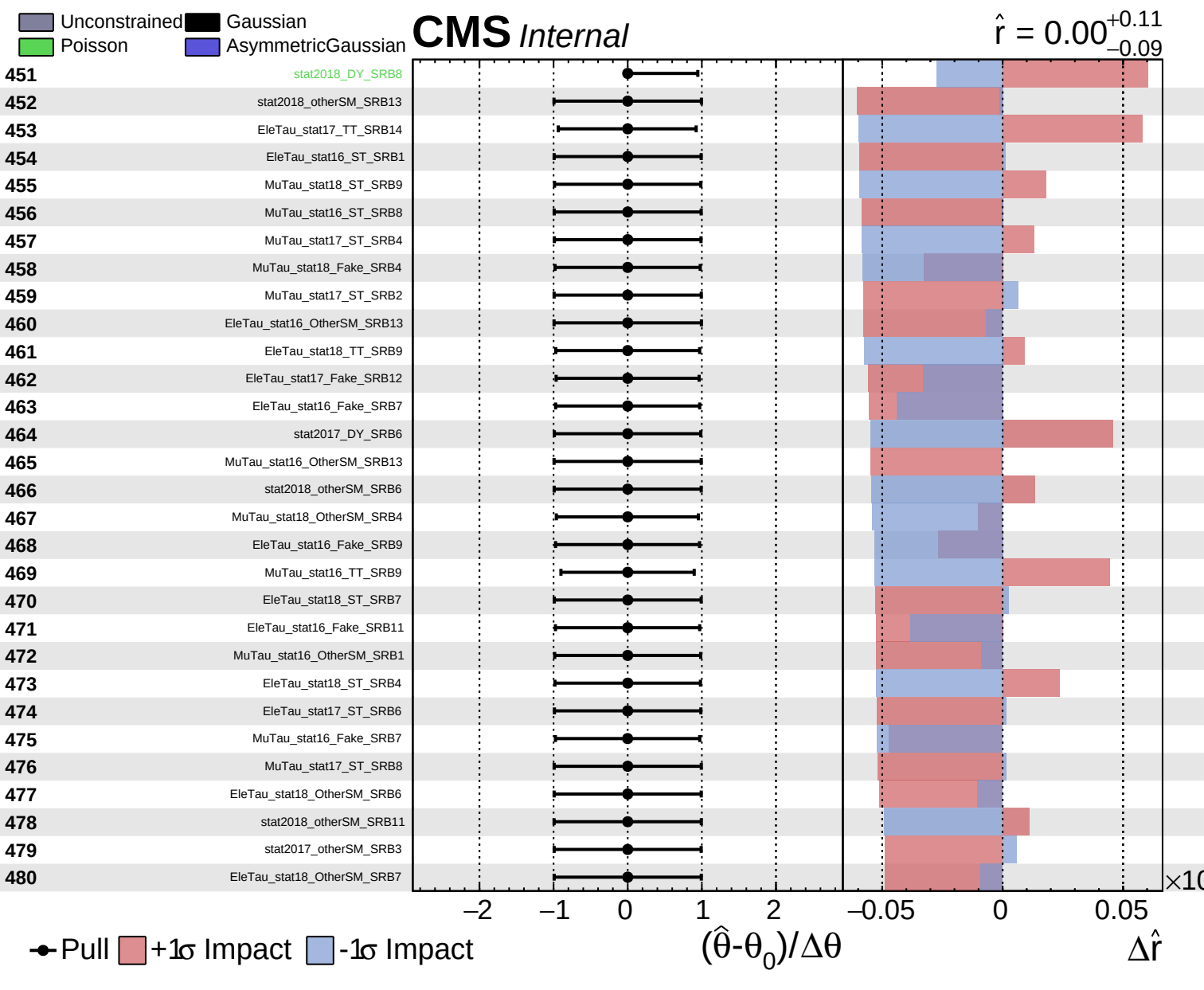
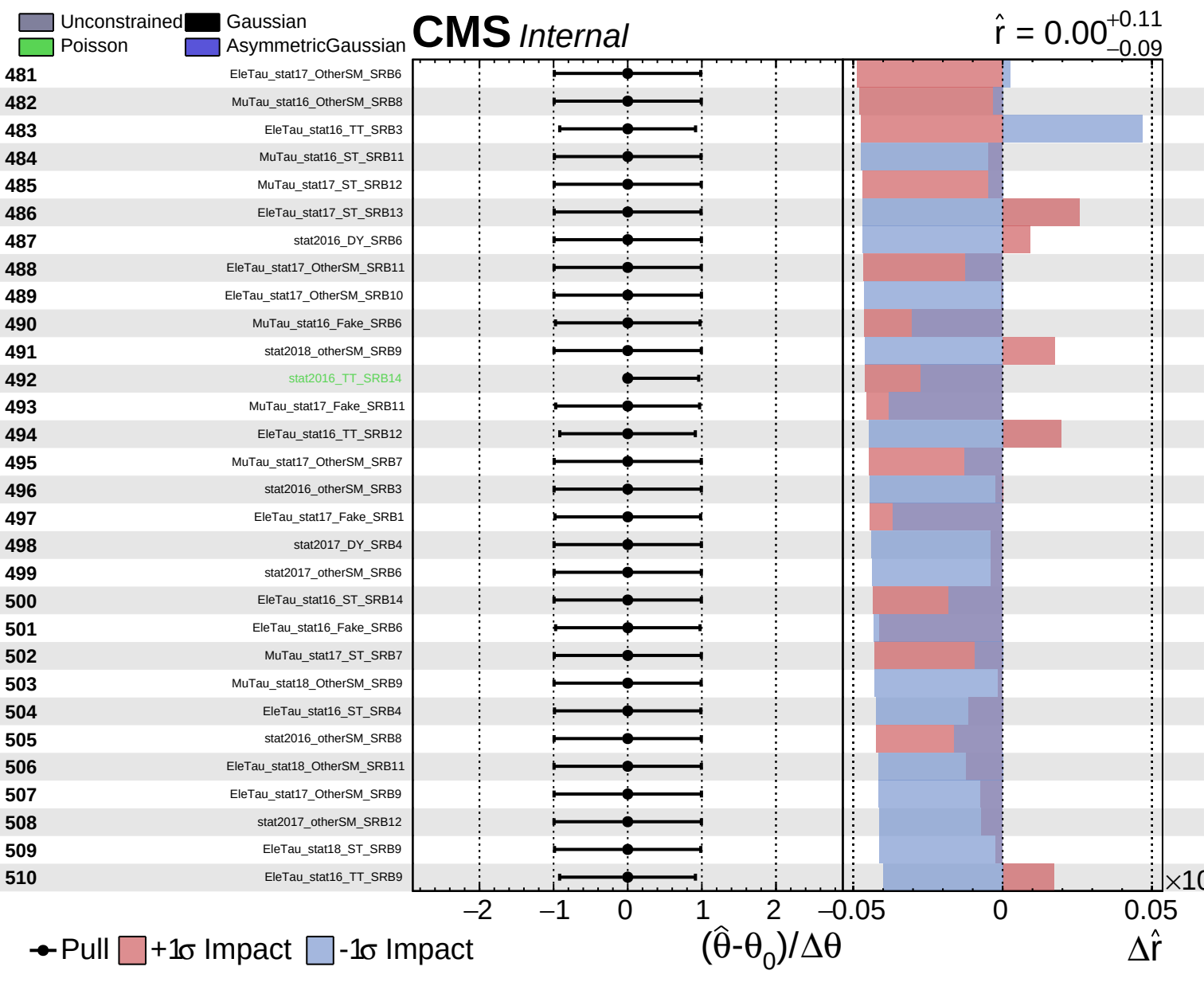
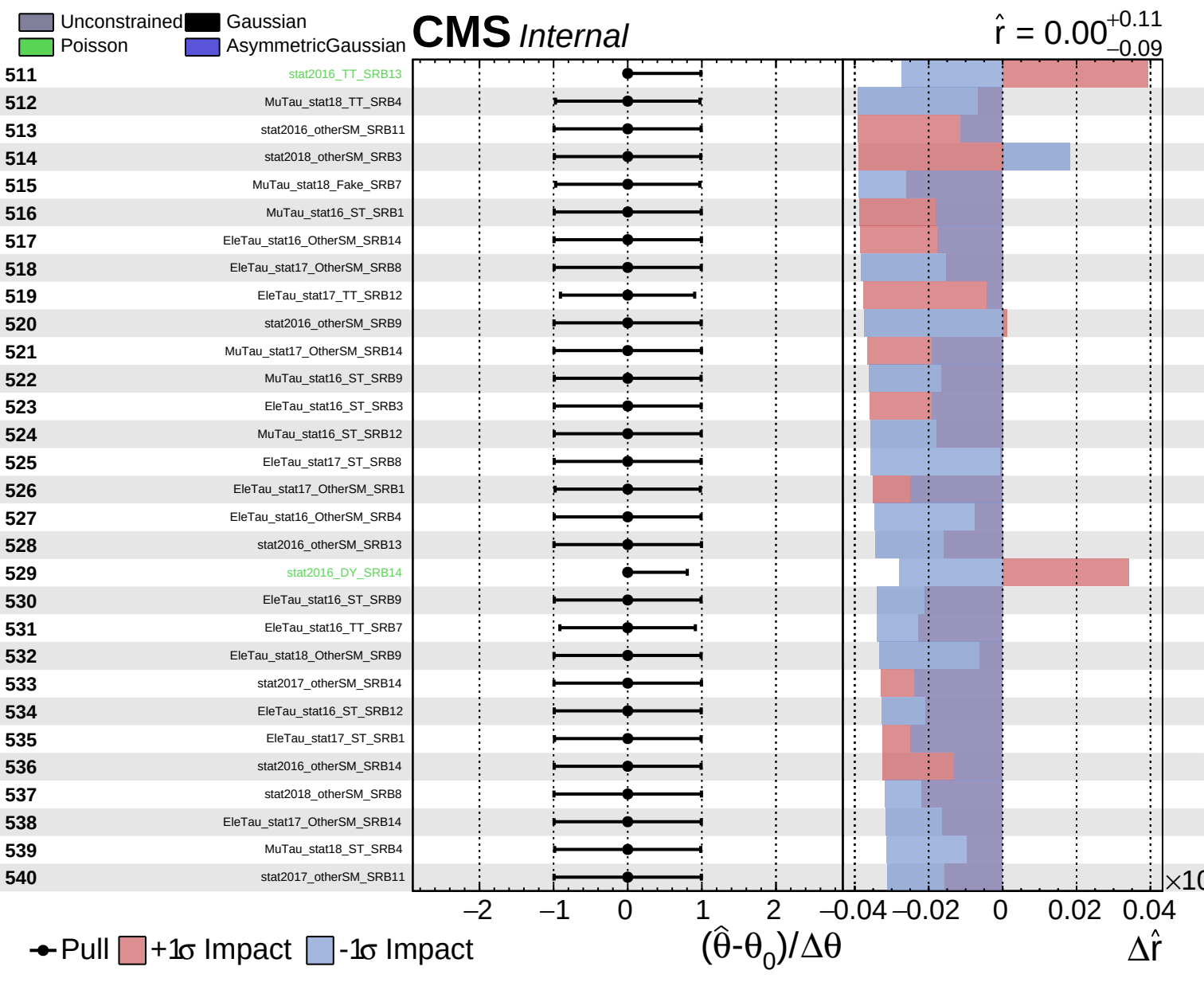
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
361 stat2017_DY_SRB11
362 stat2016_TT_SRB9
363 MuTau_stat17_OtherSM_SRB9
364 EleTau_stat17_Fake_SRB8
365 stat2016_otherSM_SRB4
366 EleTau_stat18_OtherSM_SRB12
367 MuTau_stat17_ST_SRB10
368 stat2017_otherSM_SRB13
369 EleTau_stat18_OtherSM_SRB15
370 MuTau_stat17_ST_SRB3
371 EleTau_stat17_OtherSM_SRB7
372 stat2017_otherSM_SRB4
373 EleTau_stat18_OtherSM_SRB8
374 MuTau_stat18_TT_SRB9
375 stat2017_DY_SRB7
376 stat2018_TT_SRB4
377 MuTau_stat18_ST_SRB8
378 EleTau_stat17_ST_SRB3
379 MuTau_stat16_ST_SRB14
380 stat2018_otherSM_SRB1
381 MuTau_stat16_Fake_SRB11
382 EleTau_stat16_OtherSM_SRB8
383 EleTau_stat16_ST_SRB2
384 EleTau_stat18_TT_SRB7
385 EleTau_stat17_Fake_SRB6
386 MuTau_stat16_OtherSM_SRB14
387 EleTau_stat17_ST_SRB9
388 EleTau_stat18_Fake_SRB4
389 stat2017_otherSM_SRB8
390 stat2017_TT_SRB11
×10
−2 −1 0 1 2
−0.1 −0.05 0 0.05 0.1
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂

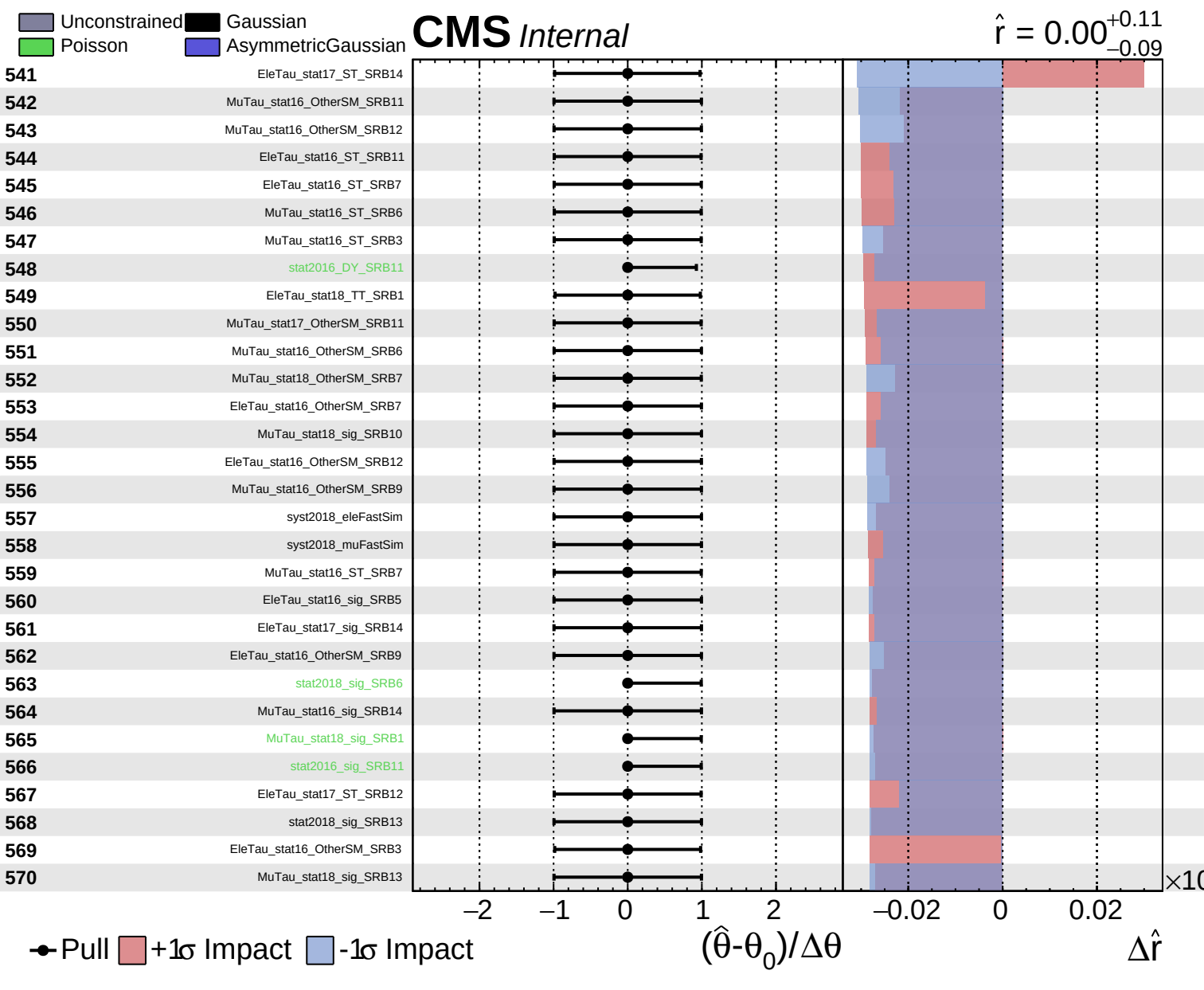

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
391 EleTau_stat18_OtherSM_SRB10
392 EleTau_stat16_Fake_SRB3
393 EleTau_stat16_OtherSM_SRB1
394 stat2016_otherSM_SRB12
395 EleTau_stat18_OtherSM_SRB4
396 stat2018_otherSM_SRB4
397 MuTau_stat18_OtherSM_SRB11
398 MuTau_stat18_ST_SRB2
399 EleTau_stat16_ST_SRB8
400 stat2016_otherSM_SRB1
401 EleTau_stat17_ST_SRB2
402 MuTau_stat16_TT_SRB7
403 stat2016_otherSM_SRB6
404 MuTau_stat16_Fake_SRB12
405 stat2017_DY_SRB3
406 stat2016_TT_SRB11
407 EleTau_stat17_TT_SRB1
408 stat2016_otherSM_SRB7
409 EleTau_stat18_Fake_SRB9
410 MuTau_stat17_ST_SRB9
411 MuTau_stat16_ST_SRB4
412 EleTau_stat18_TT_SRB4
413 MuTau_stat16_TT_SRB12
414 stat2018_TT_SRB3
415 stat2016_DY_SRB7
416 syst2017_pileupReweight
417 EleTau_stat17_TT_SRB6
418 MuTau_stat18_ST_SRB13
419 stat2018_DY_SRB11
420 stat2018_TT_SRB6
×10
−2 −1 0 1 2
−0.05 0 0.05
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

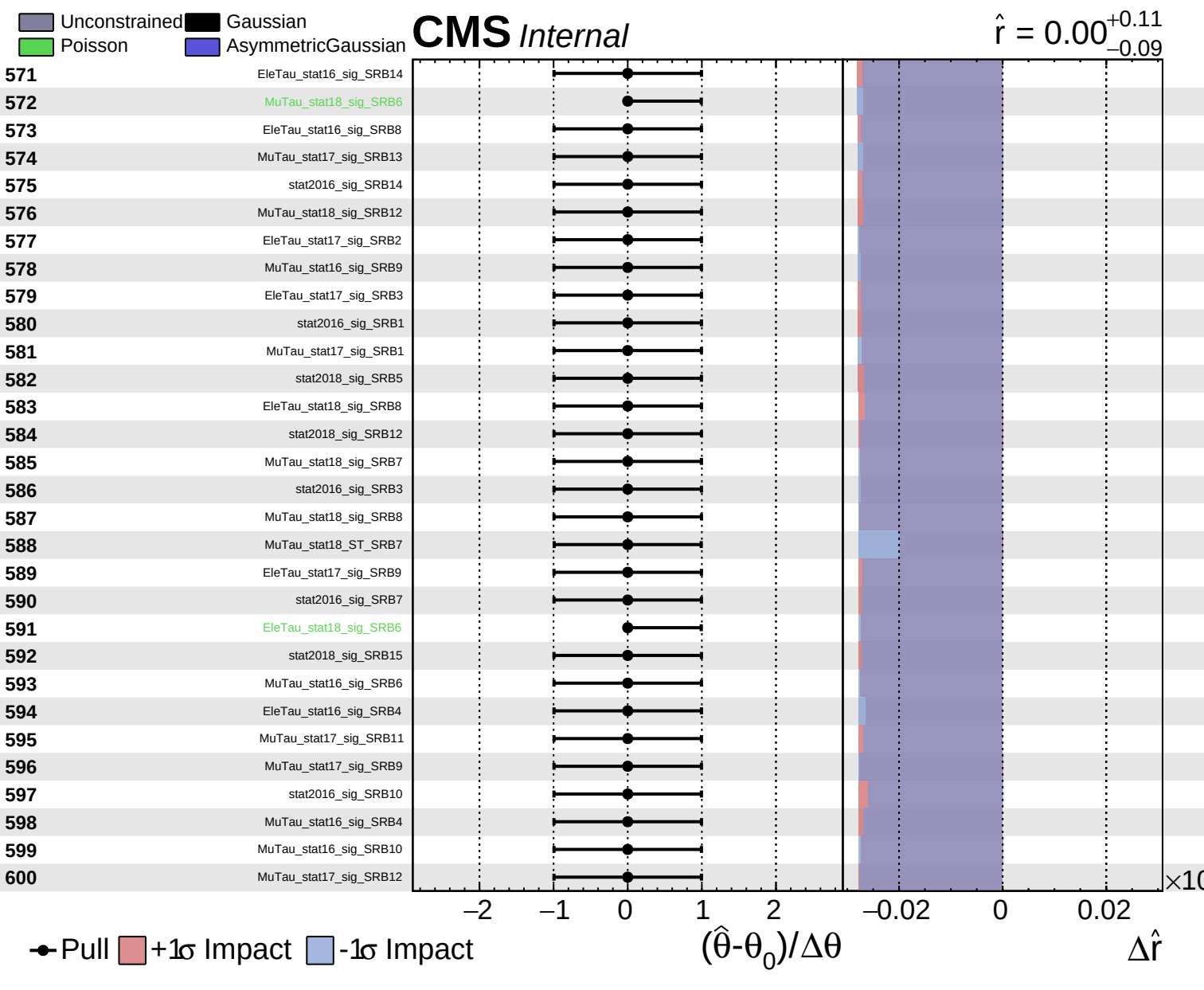

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
421 stat2017_otherSM_SRB9
422 MuTau_stat16_OtherSM_SRB10
423 EleTau_stat16_TT_SRB4
424 EleTau_stat17_ST_SRB11
425 stat2016_DY_SRB3
426 EleTau_stat17_Fake_SRB14
427 MuTau_stat16_Fake_SRB1
428 MuTau_stat17_OtherSM_SRB12
429 EleTau_stat16_Fake_SRB12
430 stat2016_DY_SRB8
431 EleTau_stat16_OtherSM_SRB10
432 EleTau_stat16_Fake_SRB4
433 MuTau_stat17_OtherSM_SRB6
434 stat2017_otherSM_SRB1
435 EleTau_stat18_ST_SRB6
436 stat2018_otherSM_SRB12
437 MuTau_stat17_OtherSM_SRB8
438 MuTau_stat18_OtherSM_SRB10
439 stat2018_TT_SRB8
440 MuTau_stat16_OtherSM_SRB4
441 stat2018_DY_SRB6
442 MuTau_stat16_Fake_SRB9
443 MuTau_stat16_ST_SRB13
444 MuTau_stat17_ST_SRB14
445 MuTau_stat16_Fake_SRB3
446 MuTau_stat17_ST_SRB6
447 stat2018_TT_SRB11
448 MuTau_stat17_OtherSM_SRB10
449 syst2017_ZpTreweight
450 stat2017_otherSM_SRB7
−2 −1 0 1 2
−0.05 0 0.05
×10
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

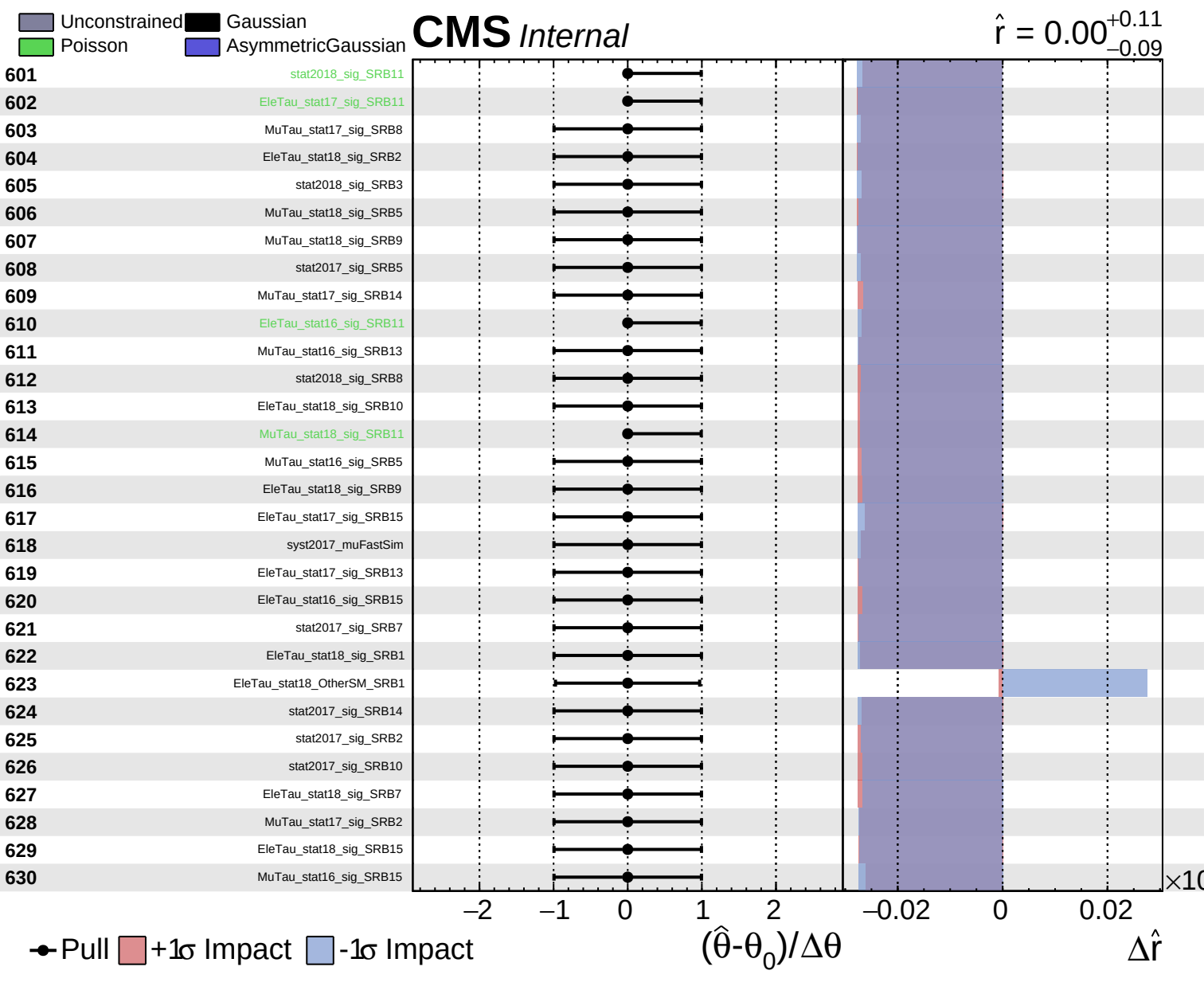

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
451 stat2018_DY_SRB8
452 stat2018_otherSM_SRB13
453 EleTau_stat17_TT_SRB14
454 EleTau_stat16_ST_SRB1
455 MuTau_stat18_ST_SRB9
456 MuTau_stat16_ST_SRB8
457 MuTau_stat17_ST_SRB4
458 MuTau_stat18_Fake_SRB4
459 MuTau_stat17_ST_SRB2
460 EleTau_stat16_OtherSM_SRB13
461 EleTau_stat18_TT_SRB9
462 EleTau_stat17_Fake_SRB12
463 EleTau_stat16_Fake_SRB7
464 stat2017_DY_SRB6
465 MuTau_stat16_OtherSM_SRB13
466 stat2018_otherSM_SRB6
467 MuTau_stat18_OtherSM_SRB4
468 EleTau_stat16_Fake_SRB9
469 MuTau_stat16_TT_SRB9
470 EleTau_stat18_ST_SRB7
471 EleTau_stat16_Fake_SRB11
472 MuTau_stat16_OtherSM_SRB1
473 EleTau_stat18_ST_SRB4
474 EleTau_stat17_ST_SRB6
475 MuTau_stat16_Fake_SRB7
476 MuTau_stat17_ST_SRB8
477 EleTau_stat18_OtherSM_SRB6
478 stat2018_otherSM_SRB11
479 stat2017_otherSM_SRB3
480 EleTau_stat18_OtherSM_SRB7
×10
−2 −1 0 1 2
−0.05 0 0.05
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂

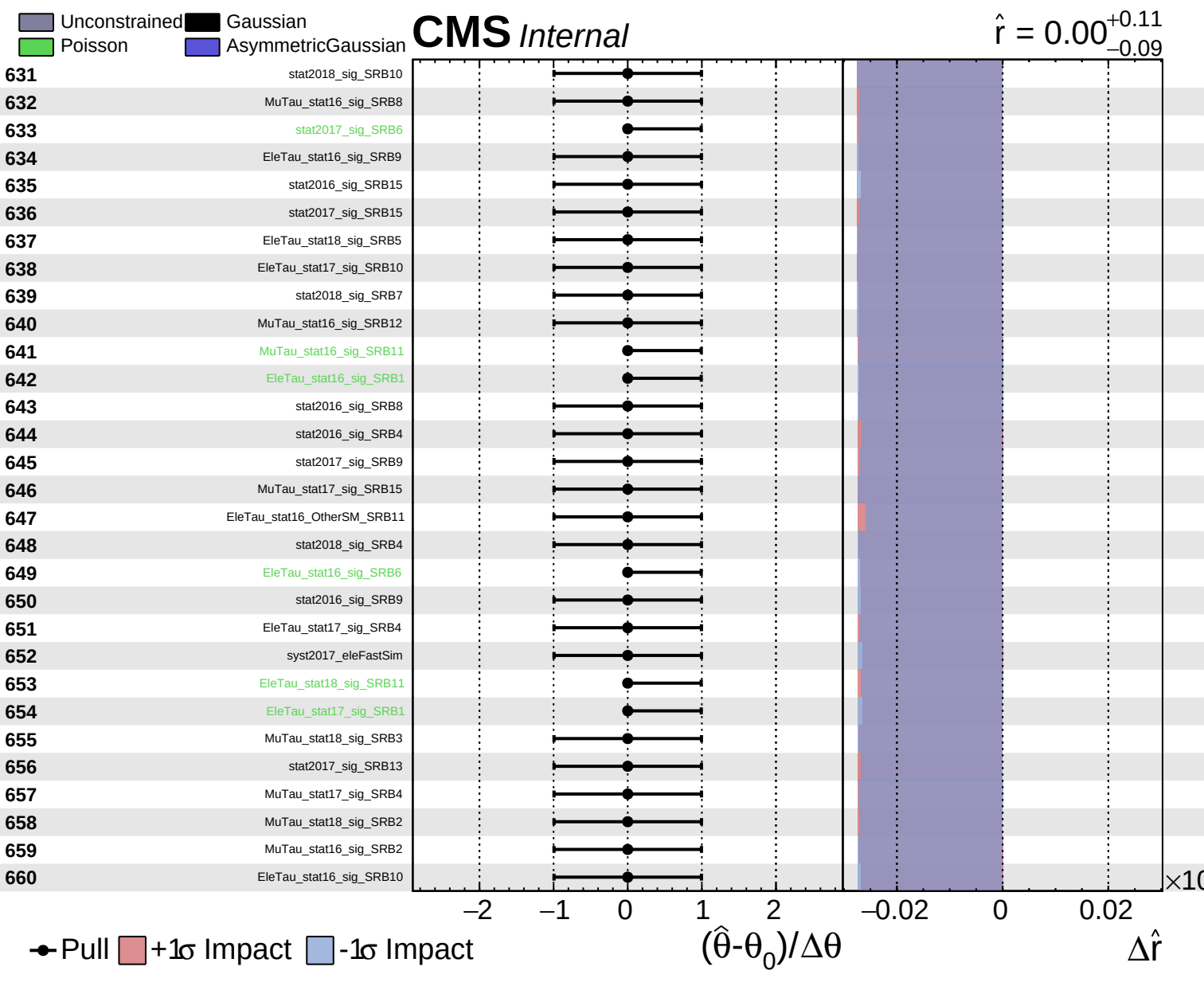

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
481 EleTau_stat17_OtherSM_SRB6
482 MuTau_stat16_OtherSM_SRB8
483 EleTau_stat16_TT_SRB3
484 MuTau_stat16_ST_SRB11
485 MuTau_stat17_ST_SRB12
486 EleTau_stat17_ST_SRB13
487 stat2016_DY_SRB6
488 EleTau_stat17_OtherSM_SRB11
489 EleTau_stat17_OtherSM_SRB10
490 MuTau_stat16_Fake_SRB6
491 stat2018_otherSM_SRB9
492 stat2016_TT_SRB14
493 MuTau_stat17_Fake_SRB11
494 EleTau_stat16_TT_SRB12
495 MuTau_stat17_OtherSM_SRB7
496 stat2016_otherSM_SRB3
497 EleTau_stat17_Fake_SRB1
498 stat2017_DY_SRB4
499 stat2017_otherSM_SRB6
500 EleTau_stat16_ST_SRB14
501 EleTau_stat16_Fake_SRB6
502 MuTau_stat17_ST_SRB7
503 MuTau_stat18_OtherSM_SRB9
504 EleTau_stat16_ST_SRB4
505 stat2016_otherSM_SRB8
506 EleTau_stat18_OtherSM_SRB11
507 EleTau_stat17_OtherSM_SRB9
508 stat2017_otherSM_SRB12
509 EleTau_stat18_ST_SRB9
510 EleTau_stat16_TT_SRB9
×10
−2 −1 0 1 2
−0.05 0 0.05
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂

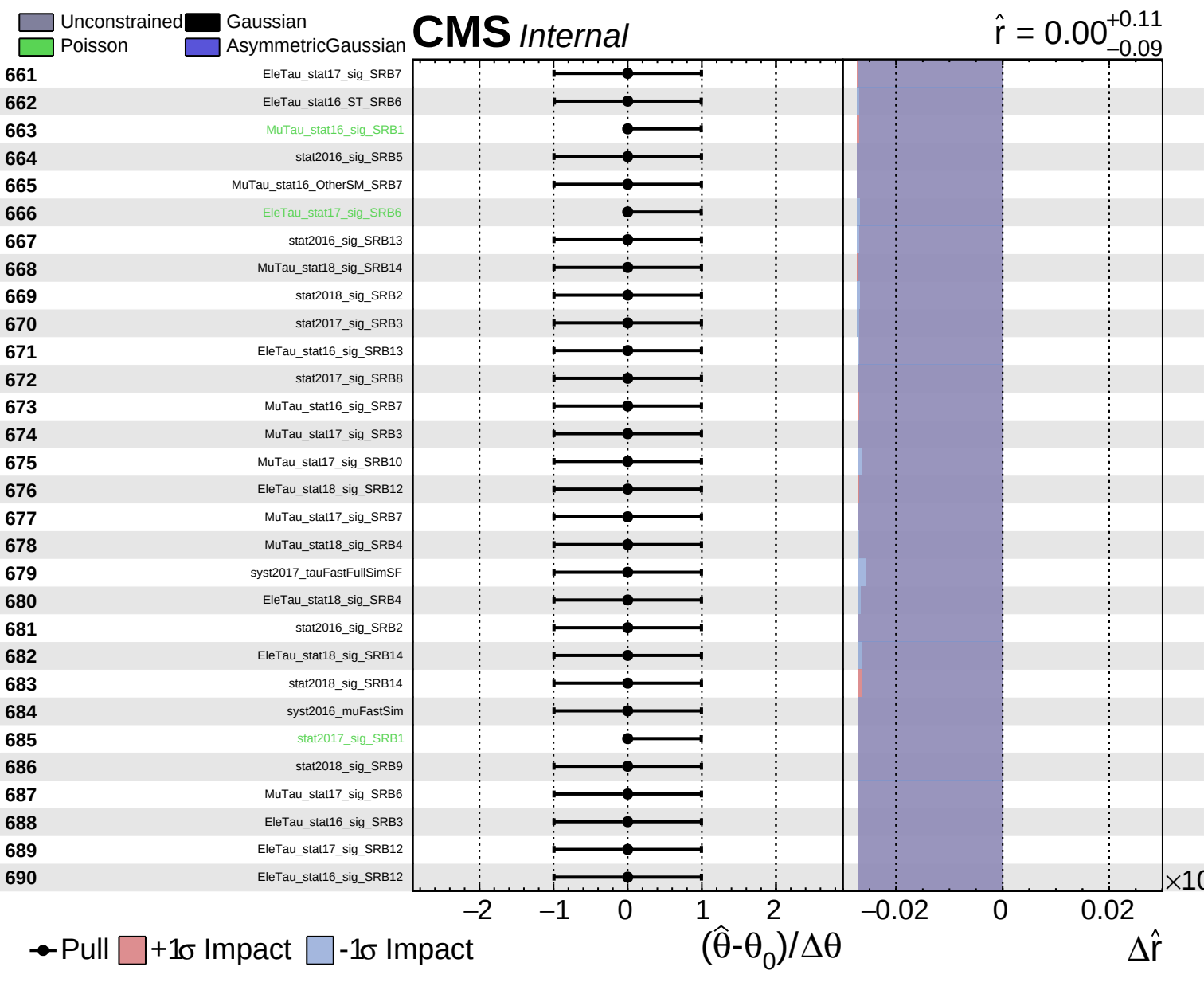

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
511 stat2016_TT_SRB13
512 MuTau_stat18_TT_SRB4
513 stat2016_otherSM_SRB11
514 stat2018_otherSM_SRB3
515 MuTau_stat18_Fake_SRB7
516 MuTau_stat16_ST_SRB1
517 EleTau_stat16_OtherSM_SRB14
518 EleTau_stat17_OtherSM_SRB8
519 EleTau_stat17_TT_SRB12
520 stat2016_otherSM_SRB9
521 MuTau_stat17_OtherSM_SRB14
522 MuTau_stat16_ST_SRB9
523 EleTau_stat16_ST_SRB3
524 MuTau_stat16_ST_SRB12
525 EleTau_stat17_ST_SRB8
526 EleTau_stat17_OtherSM_SRB1
527 EleTau_stat16_OtherSM_SRB4
528 stat2016_otherSM_SRB13
529 stat2016_DY_SRB14
530 EleTau_stat16_ST_SRB9
531 EleTau_stat16_TT_SRB7
532 EleTau_stat18_OtherSM_SRB9
533 stat2017_otherSM_SRB14
534 EleTau_stat16_ST_SRB12
535 EleTau_stat17_ST_SRB1
536 stat2016_otherSM_SRB14
537 stat2018_otherSM_SRB8
538 EleTau_stat17_OtherSM_SRB14
539 MuTau_stat18_ST_SRB4
540 stat2017_otherSM_SRB11
−2 −1 0 1 2
−0.04 −0.02 0 0.02 0.04
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂

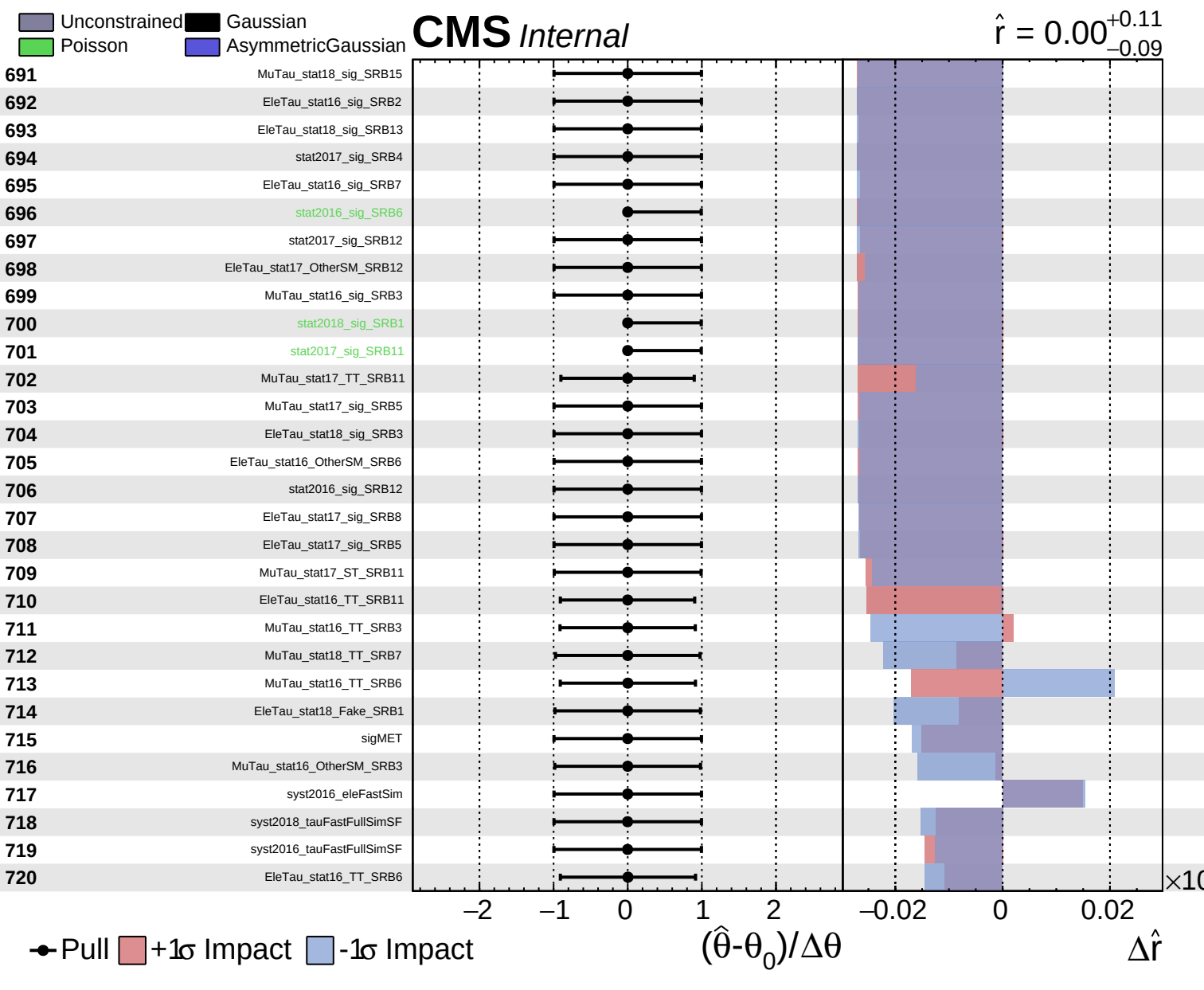

Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
541 EleTau_stat17_ST_SRB14
542 MuTau_stat16_OtherSM_SRB11
543 MuTau_stat16_OtherSM_SRB12
544 EleTau_stat16_ST_SRB11
545 EleTau_stat16_ST_SRB7
546 MuTau_stat16_ST_SRB6
547 MuTau_stat16_ST_SRB3
548 stat2016_DY_SRB11
549 EleTau_stat18_TT_SRB1
550 MuTau_stat17_OtherSM_SRB11
551 MuTau_stat16_OtherSM_SRB6
552 MuTau_stat18_OtherSM_SRB7
553 EleTau_stat16_OtherSM_SRB7
554 MuTau_stat18_sig_SRB10
555 EleTau_stat16_OtherSM_SRB12
556 MuTau_stat16_OtherSM_SRB9
557 syst2018_eleFastSim
558 syst2018_muFastSim
559 MuTau_stat16_ST_SRB7
560 EleTau_stat16_sig_SRB5
561 EleTau_stat17_sig_SRB14
562 EleTau_stat16_OtherSM_SRB9
563 stat2018_sig_SRB6
564 MuTau_stat16_sig_SRB14
565 MuTau_stat18_sig_SRB1
566 stat2016_sig_SRB11
567 EleTau_stat17_ST_SRB12
568 stat2018_sig_SRB13
569 EleTau_stat16_OtherSM_SRB3
570 MuTau_stat18_sig_SRB13
×10
−2 −1 0 1 2
−0.02 0 0.02
Pull +1σ Impact -1σ Impact
(θ̂-θ0)/Δθ
Δr̂


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
$\hat{r} = 0.00^{+0.11}_{-0.09}$
571 EleTau_stat16_sig_SRB14
572 MuTau_stat18_sig_SRB6
573 EleTau_stat16_sig_SRB8
574 MuTau_stat17_sig_SRB13
575 stat2016_sig_SRB14
576 MuTau_stat18_sig_SRB12
577 EleTau_stat17_sig_SRB2
578 MuTau_stat16_sig_SRB9
579 EleTau_stat17_sig_SRB3
580 stat2016_sig_SRB1
581 MuTau_stat17_sig_SRB1
582 stat2018_sig_SRB5
583 EleTau_stat18_sig_SRB8
584 stat2018_sig_SRB12
585 MuTau_stat18_sig_SRB7
586 stat2016_sig_SRB3
587 MuTau_stat18_sig_SRB8
588 MuTau_stat18_ST_SRB7
589 EleTau_stat17_sig_SRB9
590 stat2016_sig_SRB7
591 EleTau_stat18_sig_SRB6
592 stat2018_sig_SRB15
593 MuTau_stat16_sig_SRB6
594 EleTau_stat16_sig_SRB4
595 MuTau_stat17_sig_SRB11
596 MuTau_stat17_sig_SRB9
597 stat2016_sig_SRB10
598 MuTau_stat16_sig_SRB4
599 MuTau_stat16_sig_SRB10
600 MuTau_stat17_sig_SRB12
−2
−1
0
1
2
−0.02
0
0.02
×10
Pull
+1σ Impact
-1σ Impact
$(\hat{\theta}-\theta_0)/\Delta\theta$
$\Delta\hat{r}$


Unconstrained
Gaussian
Poisson
AsymmetricGaussian
CMS Internal
r̂ = 0.00 +0.11 −0.09
601 stat2018_sig_SRB11
602 EleTau_stat17_sig_SRB11
603 MuTau_stat17_sig_SRB8
604 EleTau_stat18_sig_SRB2
605 stat2018_sig_SRB3
606 MuTau_stat18_sig_SRB5
607 MuTau_stat18_sig_SRB9
608 stat2017_sig_SRB5
609 MuTau_stat17_sig_SRB14
610 EleTau_stat16_sig_SRB11
611 MuTau_stat16_sig_SRB13
612 stat2018_sig_SRB8
613 EleTau_stat18_sig_SRB10
614 MuTau_stat18_sig_SRB11
615 MuTau_stat16_sig_SRB5
616 EleTau_stat18_sig_SRB9
617 EleTau_stat17_sig_SRB15
618 syst2017_muFastSim
619 EleTau_stat17_sig_SRB13
620 EleTau_stat16_sig_SRB15
621 stat2017_sig_SRB7
622 EleTau_stat18_sig_SRB1
623 EleTau_stat18_OtherSM_SRB1
624 stat2017_sig_SRB14
625 stat2017_sig_SRB2
626 stat2017_sig_SRB10
627 EleTau_stat18_sig_SRB7
628 MuTau_stat17_sig_SRB2
629 EleTau_stat18_sig_SRB15
630 MuTau_stat16_sig_SRB15
−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 = 0.00 +0.11 −0.09
631 stat2018_sig_SRB10
632 MuTau_stat16_sig_SRB8
633 stat2017_sig_SRB6
634 EleTau_stat16_sig_SRB9
635 stat2016_sig_SRB15
636 stat2017_sig_SRB15
637 EleTau_stat18_sig_SRB5
638 EleTau_stat17_sig_SRB10
639 stat2018_sig_SRB7
640 MuTau_stat16_sig_SRB12
641 MuTau_stat16_sig_SRB11
642 EleTau_stat16_sig_SRB1
643 stat2016_sig_SRB8
644 stat2016_sig_SRB4
645 stat2017_sig_SRB9
646 MuTau_stat17_sig_SRB15
647 EleTau_stat16_OtherSM_SRB11
648 stat2018_sig_SRB4
649 EleTau_stat16_sig_SRB6
650 stat2016_sig_SRB9
651 EleTau_stat17_sig_SRB4
652 syst2017_eleFastSim
653 EleTau_stat18_sig_SRB11
654 EleTau_stat17_sig_SRB1
655 MuTau_stat18_sig_SRB3
656 stat2017_sig_SRB13
657 MuTau_stat17_sig_SRB4
658 MuTau_stat18_sig_SRB2
659 MuTau_stat16_sig_SRB2
660 EleTau_stat16_sig_SRB10
−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 = 0.00 +0.11 −0.09
661 EleTau_stat17_sig_SRB7
662 EleTau_stat16_ST_SRB6
663 MuTau_stat16_sig_SRB1
664 stat2016_sig_SRB5
665 MuTau_stat16_OtherSM_SRB7
666 EleTau_stat17_sig_SRB6
667 stat2016_sig_SRB13
668 MuTau_stat18_sig_SRB14
669 stat2018_sig_SRB2
670 stat2017_sig_SRB3
671 EleTau_stat16_sig_SRB13
672 stat2017_sig_SRB8
673 MuTau_stat16_sig_SRB7
674 MuTau_stat17_sig_SRB3
675 MuTau_stat17_sig_SRB10
676 EleTau_stat18_sig_SRB12
677 MuTau_stat17_sig_SRB7
678 MuTau_stat18_sig_SRB4
679 syst2017_tauFastFullSimSF
680 EleTau_stat18_sig_SRB4
681 stat2016_sig_SRB2
682 EleTau_stat18_sig_SRB14
683 stat2018_sig_SRB14
684 syst2016_muFastSim
685 stat2017_sig_SRB1
686 stat2018_sig_SRB9
687 MuTau_stat17_sig_SRB6
688 EleTau_stat16_sig_SRB3
689 EleTau_stat17_sig_SRB12
690 EleTau_stat16_sig_SRB12
−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 = 0.00 +0.11 −0.09
691 MuTau_stat18_sig_SRB15
692 EleTau_stat16_sig_SRB2
693 EleTau_stat18_sig_SRB13
694 stat2017_sig_SRB4
695 EleTau_stat16_sig_SRB7
696 stat2016_sig_SRB6
697 stat2017_sig_SRB12
698 EleTau_stat17_OtherSM_SRB12
699 MuTau_stat16_sig_SRB3
700 stat2018_sig_SRB1
701 stat2017_sig_SRB11
702 MuTau_stat17_TT_SRB11
703 MuTau_stat17_sig_SRB5
704 EleTau_stat18_sig_SRB3
705 EleTau_stat16_OtherSM_SRB6
706 stat2016_sig_SRB12
707 EleTau_stat17_sig_SRB8
708 EleTau_stat17_sig_SRB5
709 MuTau_stat17_ST_SRB11
710 EleTau_stat16_TT_SRB11
711 MuTau_stat16_TT_SRB3
712 MuTau_stat18_TT_SRB7
713 MuTau_stat16_TT_SRB6
714 EleTau_stat18_Fake_SRB1
715 sigMET
716 MuTau_stat16_OtherSM_SRB3
717 syst2016_eleFastSim
718 syst2018_tauFastFullSimSF
719 syst2016_tauFastFullSimSF
720 EleTau_stat16_TT_SRB6
−2 −1 0 1 2
−0.02 0 0.02
×10
Pull
+1σ Impact
-1σ Impact
(θ̂-θ0)/Δθ
Δr̂