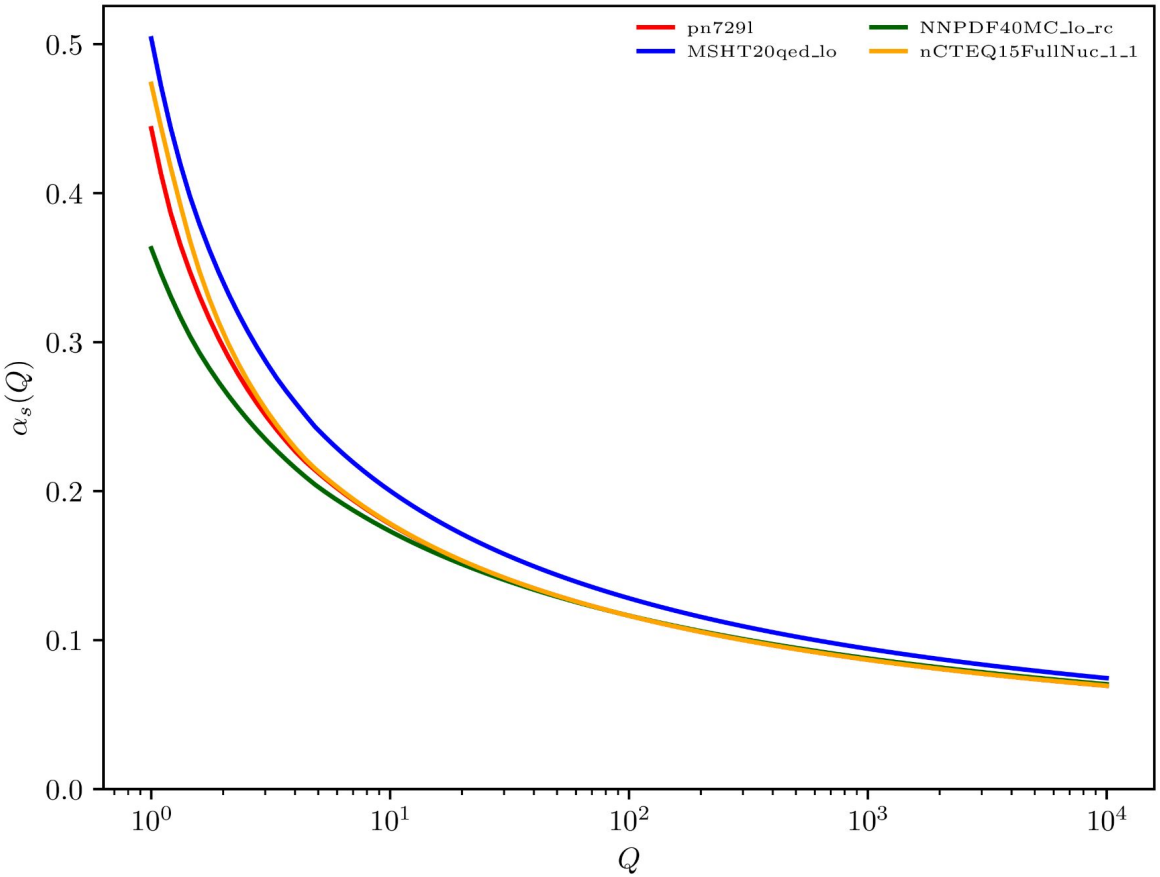
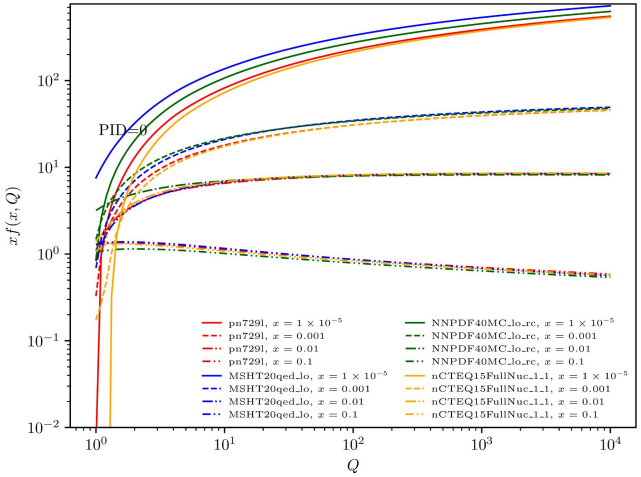
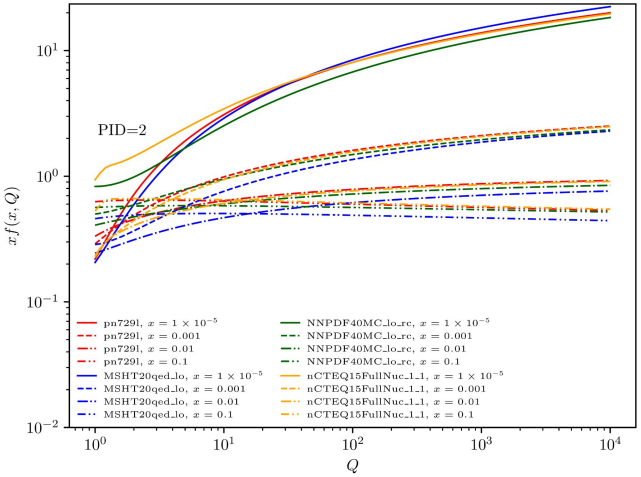
Oxford 2024:
the obligatory Tuning talk

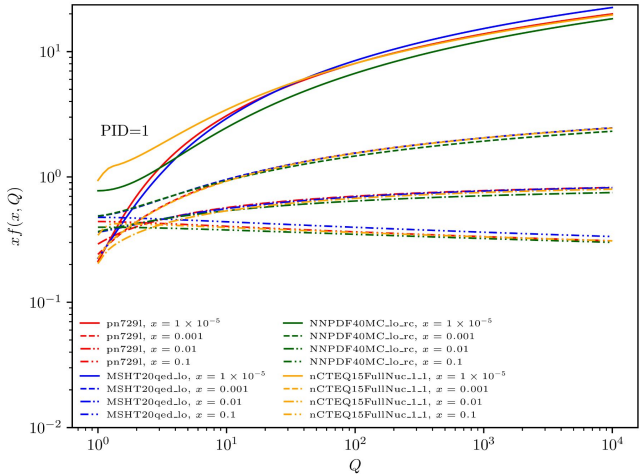
Steve Mrenna
FNAL
04-30-24


pn729l
MSHT20qed_lo
NNPDF40MC_lo_rc
nCTEQ15FullNuc_1_1
0.5
0.4
0.3
0.2
0.1
0.0
$\alpha_s(Q)$
10^0
10^1
10^2
10^3
10^4
Q



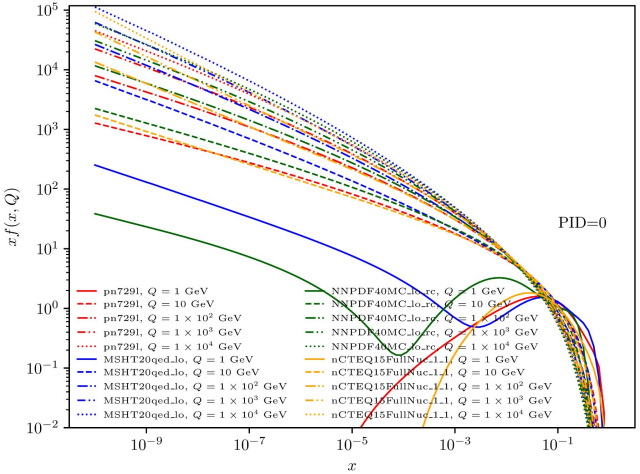
Red == CTEQ
Blue == MSHT
Green == NNPDF
Maize == Ref

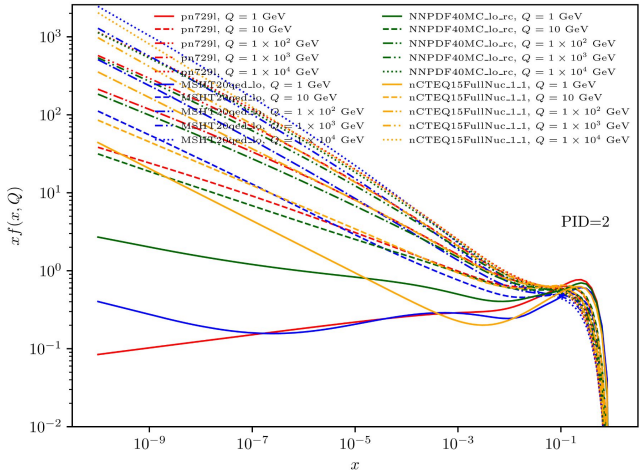




.00001
.001
.01
.1

1 GeV
10 GeV
100 GeV
1000 GeV
10000 GeV





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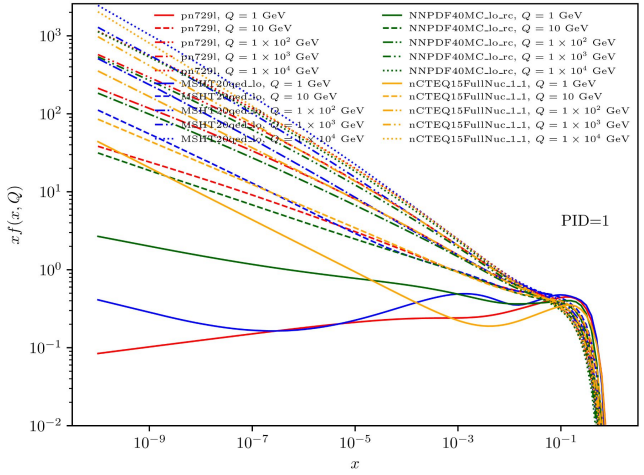

Objective value at best fit point: 7790.11 (7790.11 without weights)
Degrees of freedom: 4918
phi2/ndf: 1.584
PNAME PVALUE # COMMENT [PLOW ... PHIGH]
#
alphaSvalue 0.1317492885588164 # [0.1200389 ... 0.1349262]
coreFraction 0.5595019879089171 # [0.0007215516 ... 0.9870834]
coreRadius 0.7449348706340128 # [0.1022977 ... 0.9987267]
expPow 1.709581841111568 # [1.504854 ... 2.999976]
pT0Ref 2.4387377549310316 # [1.800934 ... 2.495001]
range 1.4404878736663318 # [1.003578 ... 4.986668]

Objective value at best fit point: 8000.18 (8000.18 without weights)
Degrees of freedom: 4933
phi2/ndf: 1.622
PNAME PVALUE # COMMENT [PLOW ... PHIGH]
#
alphaSvalue 0.1340797770494324 # [0.1200389 ... 0.1349262]
coreFraction 0.4541409484659295 # [0.0007215516 ... 0.9870834]
coreRadius 0.777721035724855 # [0.1022977 ... 0.9987267]
expPow 1.8384476739456288 # [1.504854 ... 2.999976]
pT0Ref 2.388829728220072 # [1.800934 ... 2.495001]
range 1.5289903103448643 # [1.003578 ... 4.986668]

```
# Objective value at best fit point: 7863.17 (7863.17 without weights)
# Degrees of freedom: 5604
# phi2/ndf: 1.403
# Best fit point:#
# PNAME          PVALUE             #    COMMENT    [  PLOW        ...   PHIGH    ]
#
alphaSvalue      0.13363273791388078 #              [ 0.1200389     ...  0.1349262 ]
coreFraction     0.6462031434345265  #              [ 0.0007215516  ...  0.9870834 ]
coreRadius       0.42100932612122 72  #             [ 0.1022977     ...  0.9987267 ]
expPow           1.8582519665088024  #             [ 1.504854      ...  2.999976  ]
pT0Ref           2.045645543879333   #             [ 1.800934      ...  2.495001  ]
range            1.774389461627142   #             [ 1.003578      ...  4.986668  ]
```