



Zy Norm  
 Wy Norm  
 Wty Norm  
 leptonSF\_EL\_SF\_SIMPLIFIED\_Reco\_7  
 highpt\_uncalib\_ljet  
 highpt\_uncalib\_cjet  
 highpt\_uncalib\_bjet  
 tty\_prod\_var3c  
 tty\_prod\_muR  
 tty\_prod\_muF  
 tty\_prod\_PDF4LHC\_9  
 tty\_prod\_PDF4LHC\_8  
 tty\_prod\_PDF4LHC\_6  
 tty\_prod\_PDF4LHC\_5  
 tty\_prod\_PDF4LHC\_4  
 tty\_prod\_PDF4LHC\_30  
 tty\_prod\_PDF4LHC\_3  
 tty\_prod\_PDF4LHC\_29  
 tty\_prod\_PDF4LHC\_28  
 tty\_prod\_PDF4LHC\_27  
 tty\_prod\_PDF4LHC\_26  
 tty\_prod\_PDF4LHC\_25  
 tty\_prod\_PDF4LHC\_24  
 tty\_prod\_PDF4LHC\_22  
 tty\_prod\_PDF4LHC\_21  
 tty\_prod\_PDF4LHC\_20  
 tty\_prod\_PDF4LHC\_2  
 tty\_prod\_PDF4LHC\_19  
 tty\_prod\_PDF4LHC\_18  
 tty\_prod\_PDF4LHC\_17  
 tty\_prod\_PDF4LHC\_16  
 tty\_prod\_PDF4LHC\_15  
 tty\_prod\_PDF4LHC\_14  
 tty\_prod\_PDF4LHC\_13  
 tty\_prod\_PDF4LHC\_12  
 tty\_prod\_PDF4LHC\_11  
 tty\_prod\_PDF4LHC\_10  
 tty\_prod\_PDF4LHC\_1  
 tty\_prod\_Herwig7  
 tty\_dec\_var3c  
 tty\_dec\_muF  
 tty\_dec\_Herwig7  
 ttbar\_pt\_hard  
 ttbar Norm  
 ttbar\_hdamp\_var  
 ttbar\_Herwig7  
 ty(l channel) Norm  
 lepfakeSF\_var2  
 lepfakeSF\_var1  
 lepfakeSF\_  
 hfakeSF\_  
 efakeSF\_  
 Wty\_muF  
 Wty\_Herwig7  
 Wt\_Herwig7  
 Photon\_effIso  
 Photon\_ID  
 PileupRW  
 Muon\_SF\_Trigger\_SYST  
 Muon\_SF\_Isol\_STAT  
 Muon\_SF\_ID\_TRUTH  
 MET\_SoftTrk\_Scale  
 MET\_SoftTrk\_ResoPerp  
 MET\_SoftTrk\_ResoPara  
 Luminosity  
 JVTscalefactor  
 JET\_Pileup\_RhoTopology  
 JET\_Pileup\_PtTerm  
 JET\_Pileup\_OffsetNPV  
 JET\_Pileup\_OffsetMu  
 JET\_JER\_EffectiveNP\_9  
 JET\_JER\_EffectiveNP\_8  
 JET\_JER\_EffectiveNP\_7  
 JET\_JER\_EffectiveNP\_6  
 JET\_JER\_EffectiveNP\_5  
 JET\_JER\_EffectiveNP\_4  
 JET\_JER\_EffectiveNP\_3  
 JET\_JER\_EffectiveNP\_2  
 JET\_JER\_EffectiveNP\_12resTerm  
 JET\_JER\_EffectiveNP\_11  
 JET\_JER\_EffectiveNP\_10  
 JET\_JER\_EffectiveNP\_1  
 JET\_JER\_DataVsMC\_MC16  
 JET\_Flavor\_Response  
 JET\_Flavor\_Composition  
 JET\_EtaIntercalibration\_TotalStat  
 JET\_EtaIntercalibration\_NonClosure\_negEta  
 JET\_EtaIntercalibration\_NonClosure\_2018data  
 JET\_EffectiveNP\_Statistical3  
 JET\_EffectiveNP\_Modelling3  
 JET\_EffectiveNP\_Modelling1  
 JET\_EffectiveNP\_Mixed2  
 JET\_EffectiveNP\_Mixed1  
 JET\_BJES\_Response  
 Electron\_Iso\_SF\_8  
 Electron\_Iso\_SF\_0  
 Electron\_ID\_SF\_7  
 Electron\_ID\_SF\_23  
 EG\_SCALE\_ALL  
 EG\_RESOLUTION\_ALL  
 BTag\_Light\_9  
 BTag\_Light\_8  
 BTag\_Light\_7  
 BTag\_Light\_6  
 BTag\_Light\_5  
 BTag\_Light\_4  
 BTag\_Light\_3  
 BTag\_Light\_2  
 BTag\_Light\_19  
 BTag\_Light\_18  
 BTag\_Light\_17  
 BTag\_Light\_16  
 BTag\_Light\_15  
 BTag\_Light\_14  
 BTag\_Light\_13  
 BTag\_Light\_12  
 BTag\_Light\_11  
 BTag\_Light\_10  
 BTag\_Light\_1  
 BTag\_Light\_0  
 BTag\_C\_9  
 BTag\_C\_8  
 BTag\_C\_7  
 BTag\_C\_6  
 BTag\_C\_5  
 BTag\_C\_4  
 BTag\_C\_3  
 BTag\_C\_2  
 BTag\_C\_19  
 BTag\_C\_18  
 BTag\_C\_17  
 BTag\_C\_16  
 BTag\_C\_15  
 BTag\_C\_14  
 BTag\_C\_13  
 BTag\_C\_12  
 BTag\_C\_11  
 BTag\_C\_10  
 BTag\_C\_1  
 BTag\_C\_0  
 BTag\_B\_9  
 BTag\_B\_8  
 BTag\_B\_7  
 BTag\_B\_6  
 BTag\_B\_5  
 BTag\_B\_44  
 BTag\_B\_43  
 BTag\_B\_42  
 BTag\_B\_41  
 BTag\_B\_40  
 BTag\_B\_39  
 BTag\_B\_38  
 BTag\_B\_37  
 BTag\_B\_36  
 BTag\_B\_35  
 BTag\_B\_34  
 BTag\_B\_33  
 BTag\_B\_32  
 BTag\_B\_31  
 BTag\_B\_30  
 BTag\_B\_3  
 BTag\_B\_29  
 BTag\_B\_28  
 BTag\_B\_27  
 BTag\_B\_26  
 BTag\_B\_25  
 BTag\_B\_24  
 BTag\_B\_23  
 BTag\_B\_22  
 BTag\_B\_21  
 BTag\_B\_20  
 BTag\_B\_2  
 BTag\_B\_19  
 BTag\_B\_18  
 BTag\_B\_17  
 BTag\_B\_16  
 BTag\_B\_15  
 BTag\_B\_14  
 BTag\_B\_13  
 BTag\_B\_12  
 BTag\_B\_11  
 BTag\_B\_10  
 BTag\_B\_1  
 BTag\_B\_0

-2 -1 0 1 2  
 $(\phi - \phi_0)/\Delta\phi$