

TOP-22-006 CWR checks: Apr 18, 2023

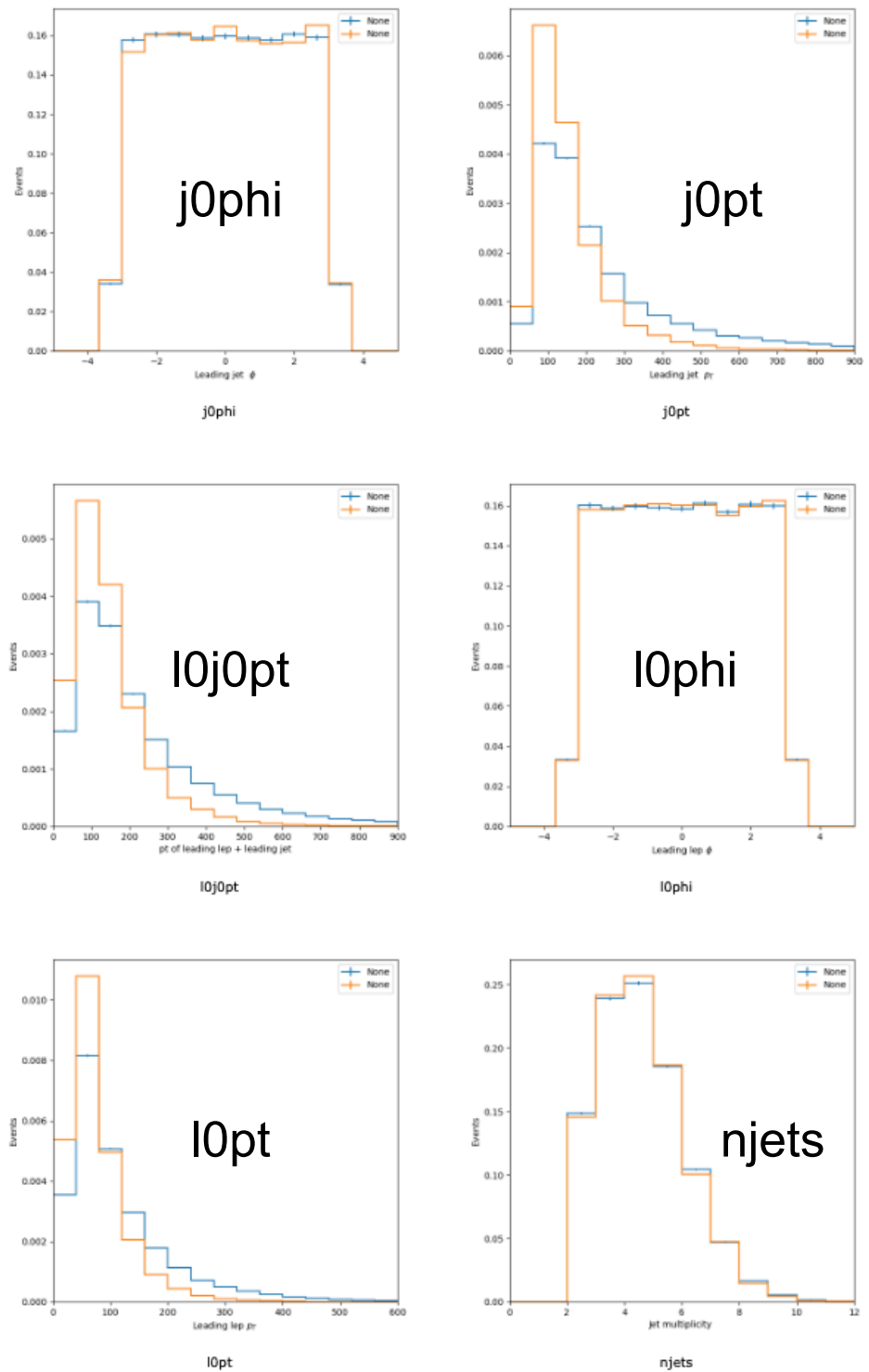
Reweight check for differential distributions

Kelci Mohrman

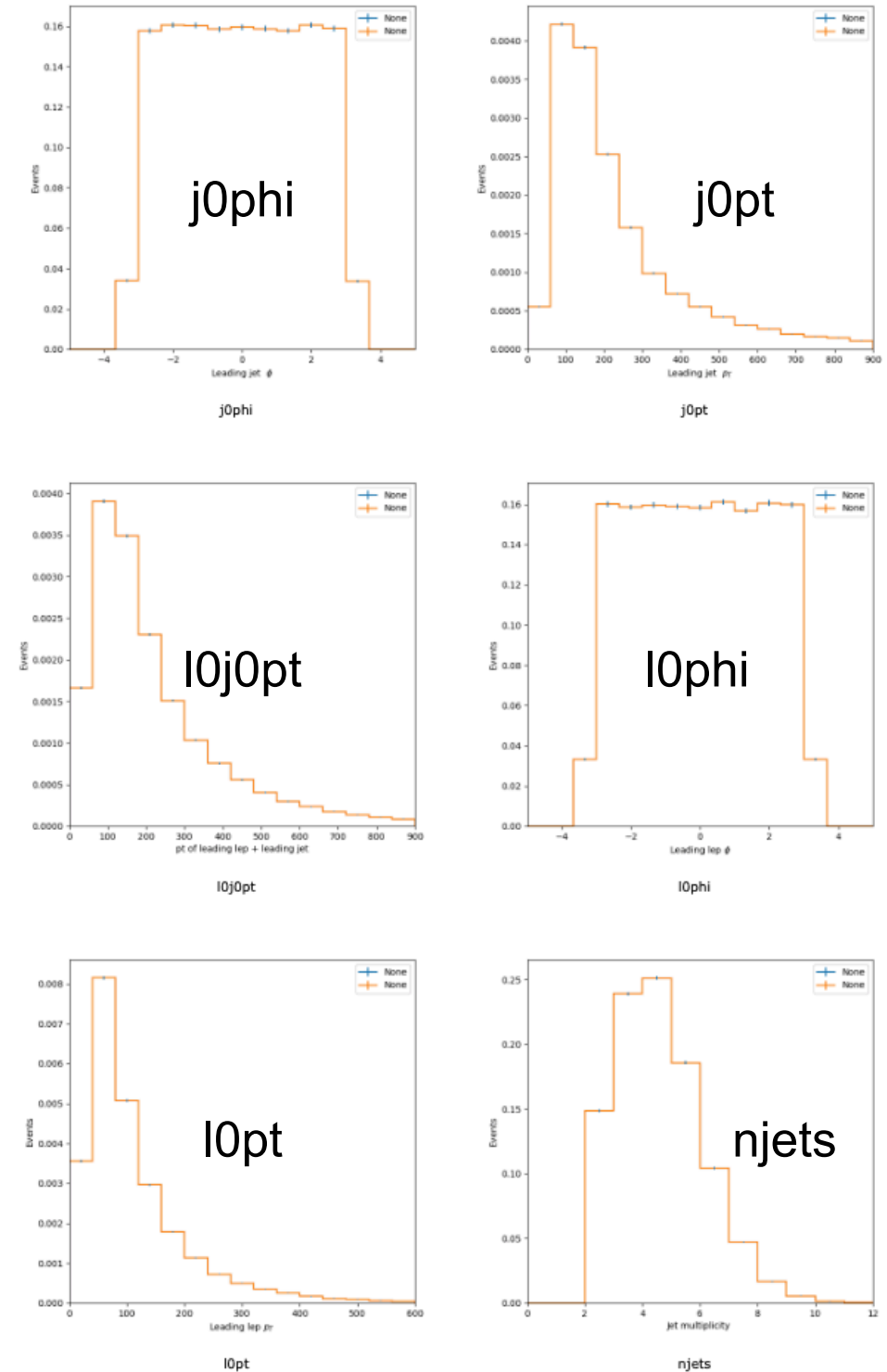
Reference info

- Samples (ttH+j):
 - Nominal ("Nom.") sample, i.e. produced from the gridpack we use in TOP-22-006
`/hadoop/store/user/kmohrman/gridpack_scans/FullR2Studies/ValidationChecks/
ttHJet_all122WCsStartPtCheckdim6TopMay20GST_run0_slc7_amd64_gcc630_CMSSW_9_3_16_tarball.tar.xz`
 - Alternate ("Alt.") sample is produced at a different starting point than Nom.
`/hadoop/store/user/kmohrman/gridpack_scans/FullR2Studies/ValidationChecks/
ttHJet_all122WCsStartPtCheckdim6TopMay20GST_run1_slc7_amd64_gcc630_CMSSW_9_3_16_tarball.tar.xz`
- Selection:
 - Selecting events with ≥ 3 lep ($pt > 15\text{GeV}$), ≥ 2 jets ($pt > 30\text{GeV}$ and some basic dr cleaning), did not make any b jet requirement though probably should have
- Distributions:
 - j0phi: phi of the leading jet (as a control, since should not be impacted by EFT)
 - l0phi: phi of the leading lep (as a control, since should not be impacted by EFT)
 - j0pt: pt of leading lep
 - l0pt: pt of leading jet
 - l0j0pt: A proxy for lj0pt, but to make it simpler I just took it as the pt of (l0 + j0)
 - njets: jet multiplicity

The Alt. Sample can be consistently reweighted to its own starting point

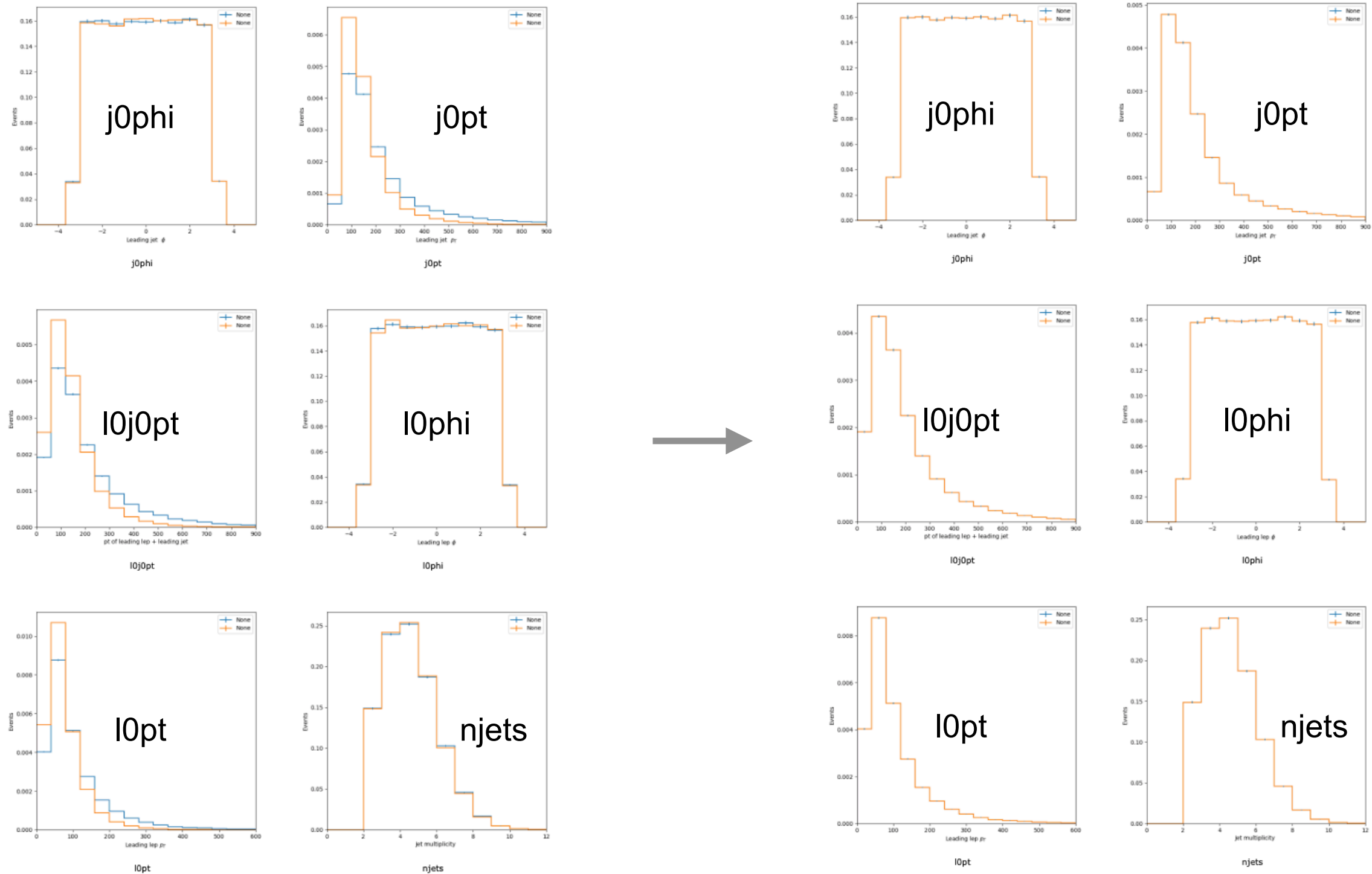


Alt. Sample (at starting point)
Alt. Sample (reweighted to SM)



Alt. Sample (at starting point)
Alt. Sample (reweighted to Alt. starting point)

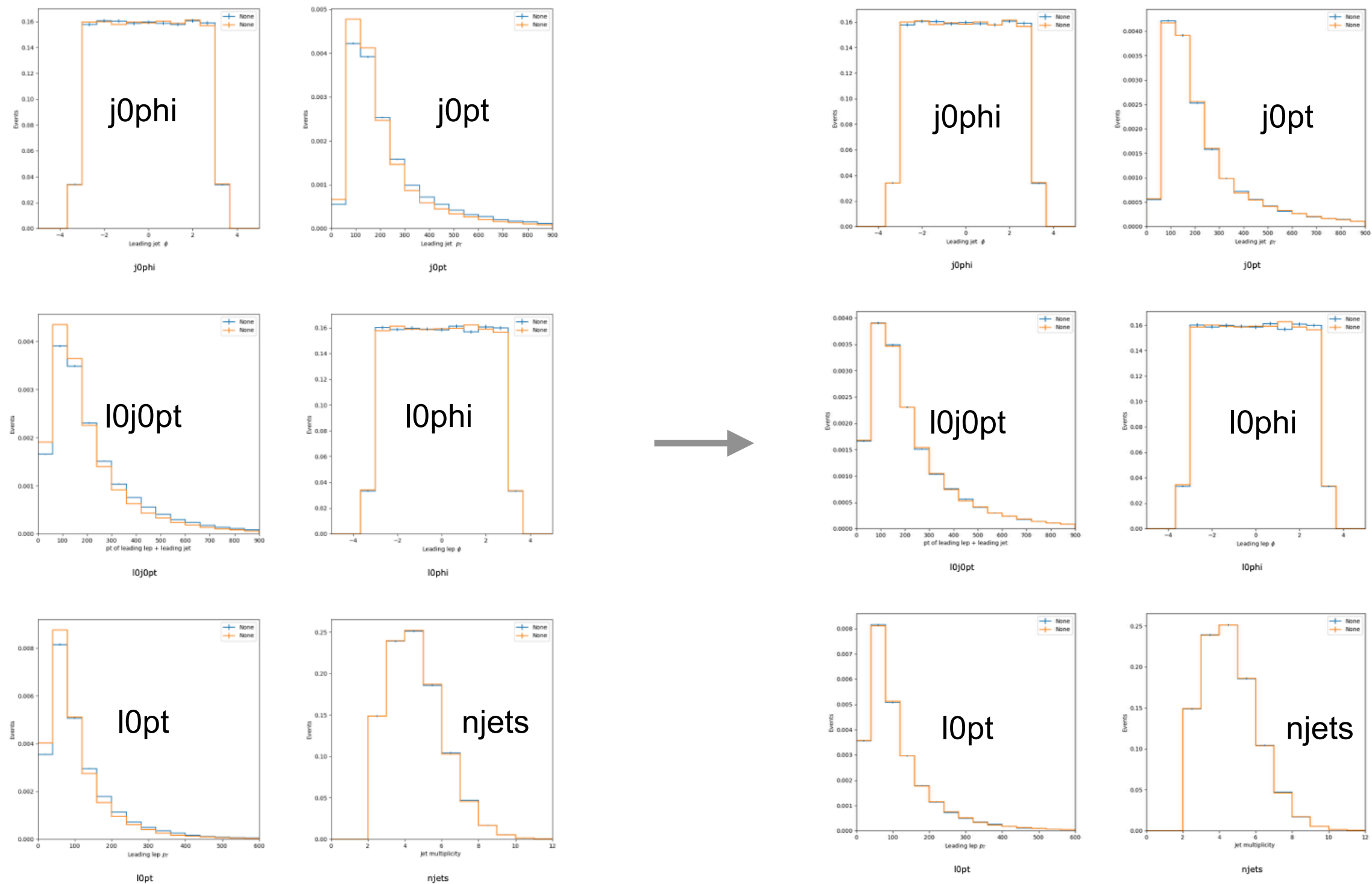
The Nom. Sample can be consistently reweighted to its own starting point



Nom. Sample (at starting point)
Nom. Sample (reweighted to SM)

Nom. Sample (at starting point)
Nom. Sample (reweighted to Nom. starting point)

The Nom. Sample can be consistently reweighted to the Alt. Sample's starting point



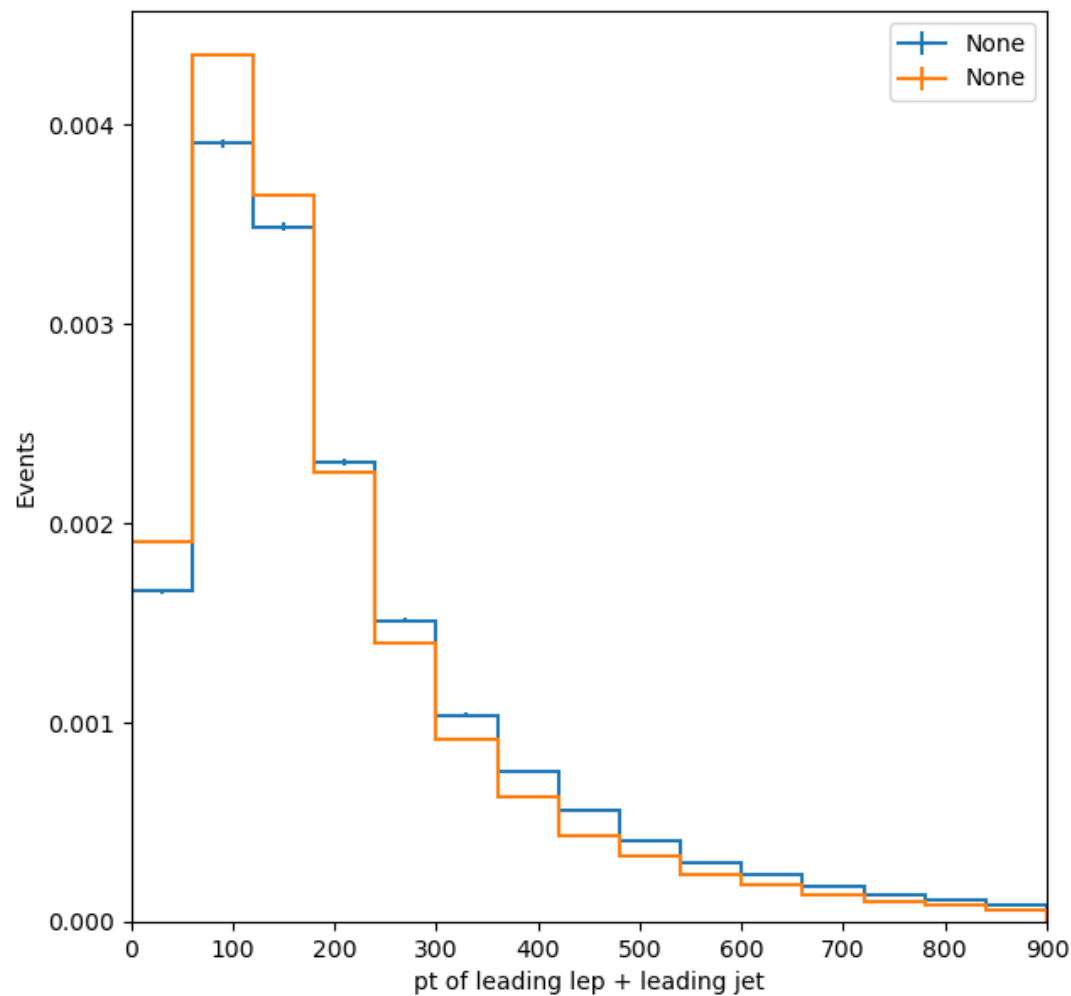
Alt. Sample (at starting point)

Nom. Sample (reweighted to Nom. starting point)

Alt. Sample (at starting point)

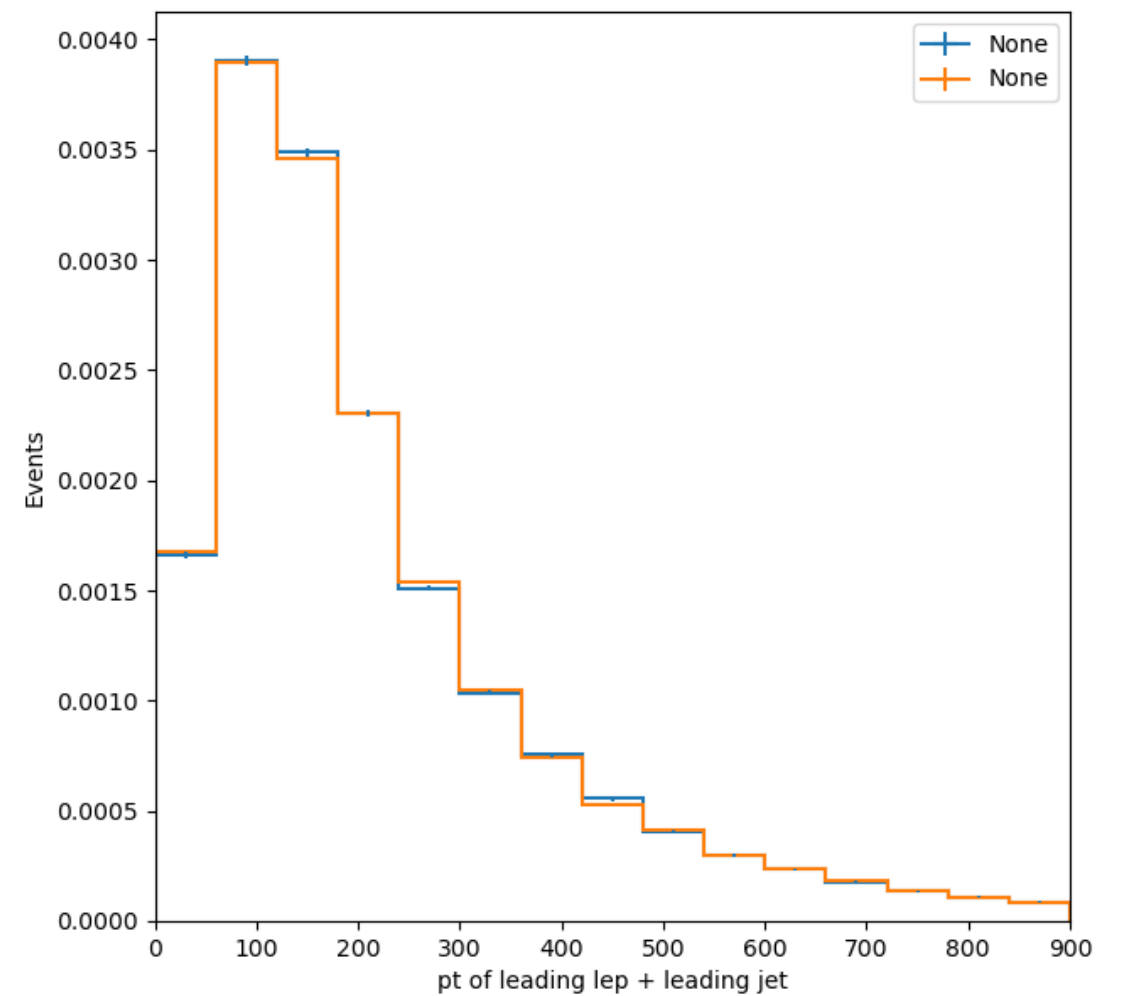
Nom. Sample (reweighted to Alt. starting point)

So I think we can conclude reweighting looks ok
(This slide shows a zoom in on just the "proxy for lj0pt" plot)



Alt. Sample (at starting point)
Nom. Sample (reweighted to Nom. starting point)

→
Reweighting
the **Nom.**
sample to the
Alt. sample's
starting point



Alt. Sample (at starting point)
Nom. Sample (reweighted to Alt. starting point)