Jet Studies in MC

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Samples

QCD 20-40 (also have 40,80,160,320)

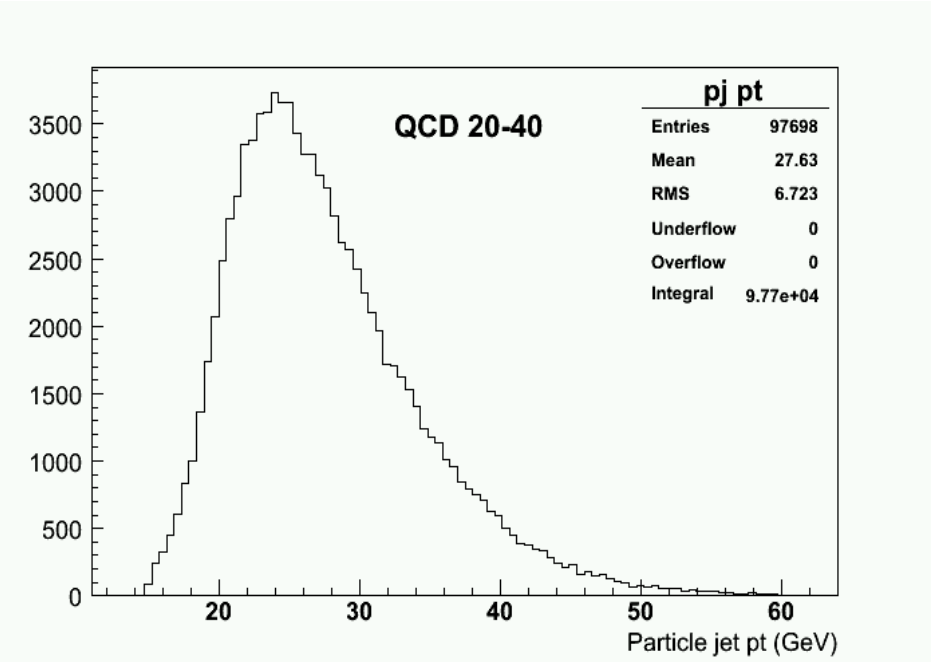
Z->bb, qq

p17 MC

Particles jets (JCCA being used, but have JCCB too)

JCCA jets (JES+JSSR)

JCCB jets (JES+JSSR)



CAF files on /rooms/beam/haas/cabsrv1

Macro for analysis (loop3.C) publicly available

Match leading two particle jets to leading two reco A and B jets within dR<0.5

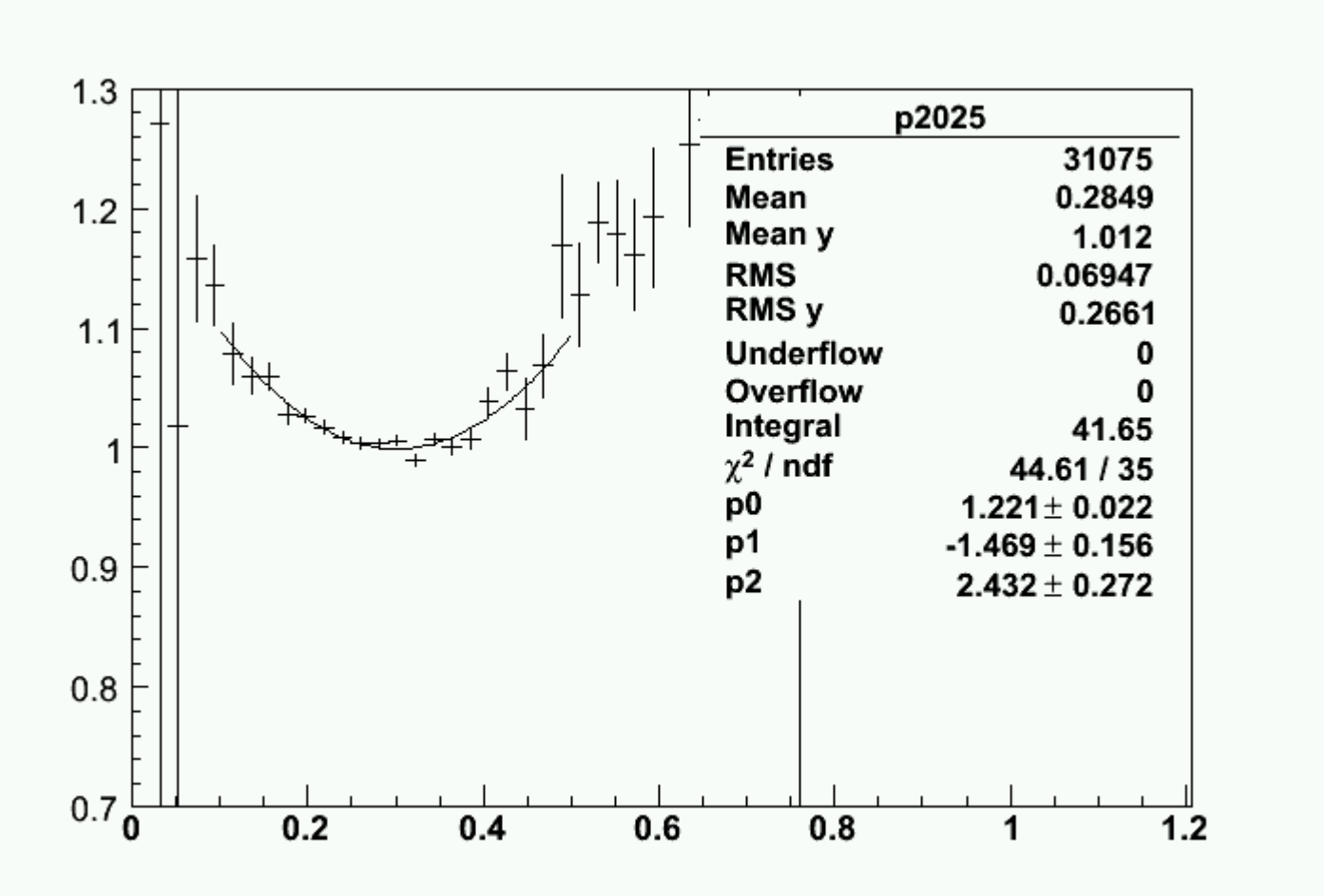
Jet Width

Compare (JCCA reco pT / JCCA particle pT) vs. JCCA width

Bin in 5 GeV bins of JCCA particle pT

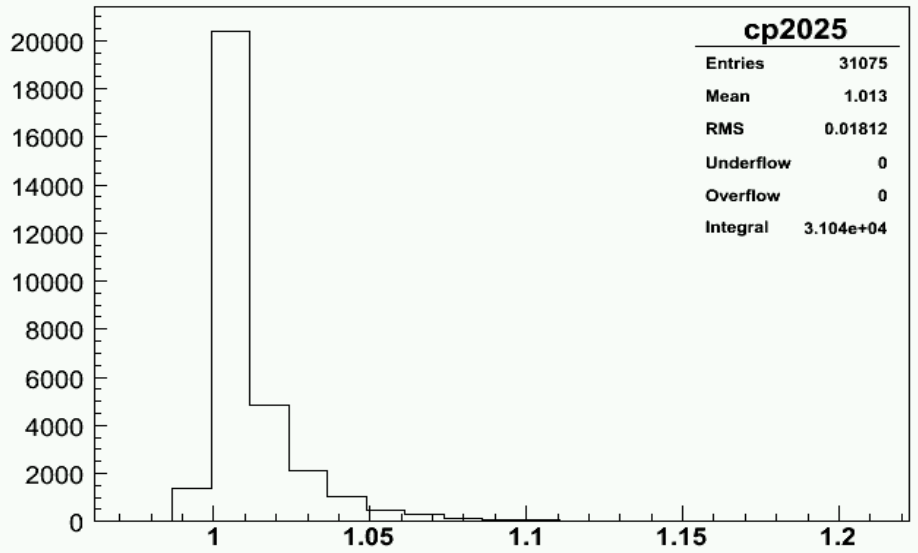
Here's QCD 20-40 sample for 20<pt<25

There is some dependence...

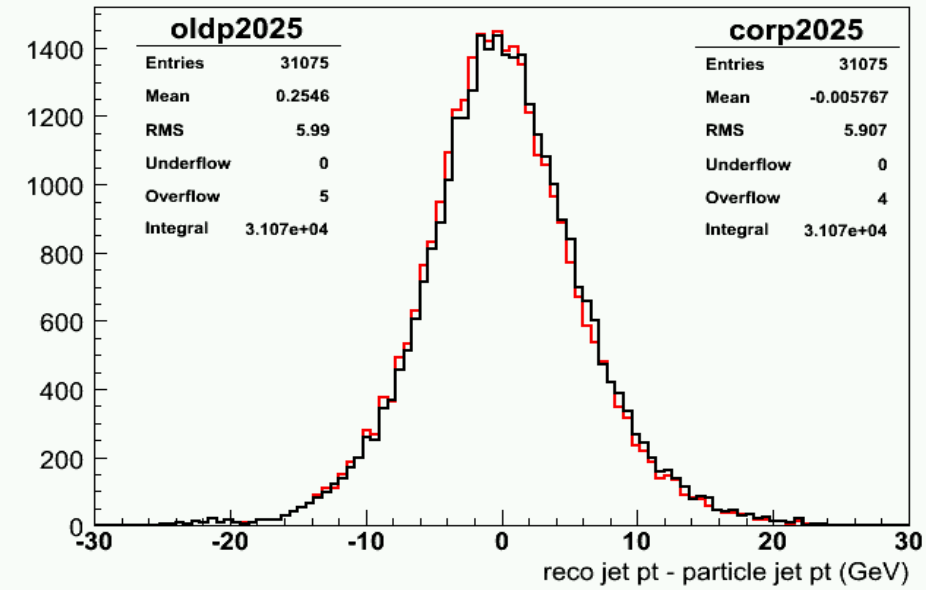


Jet Width

But the average correction is very small (~1%)...



And thus the corrected jet resolution is also just a little bit better (~1%)

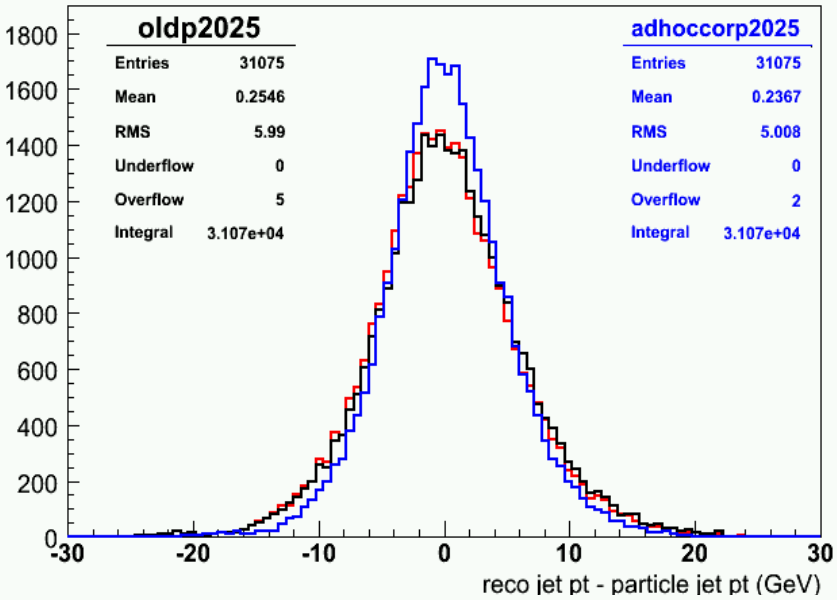


Jet Width

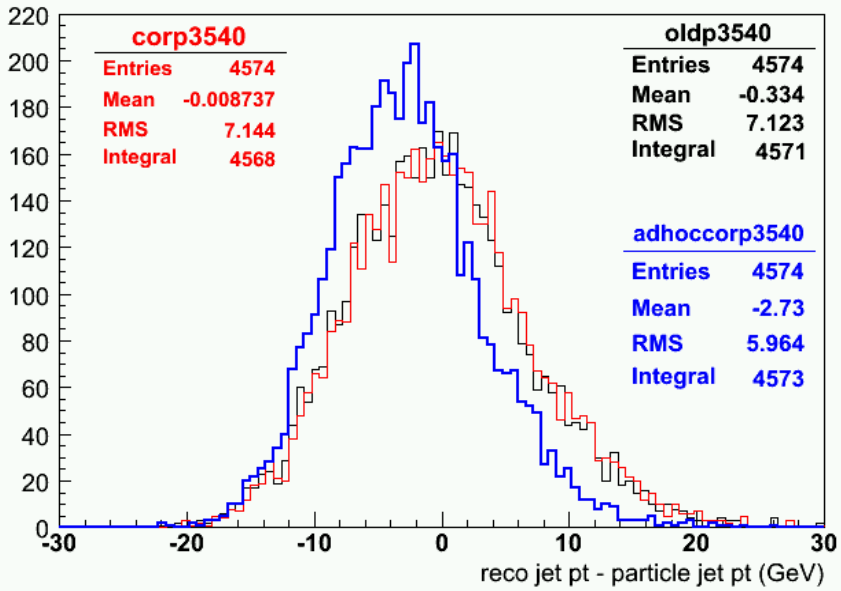
Note that it's easy to create false resolution improvements

pT/1.2 + 3.8 does very well (on this jet pt spectrum)

A 16% resolution improvement!



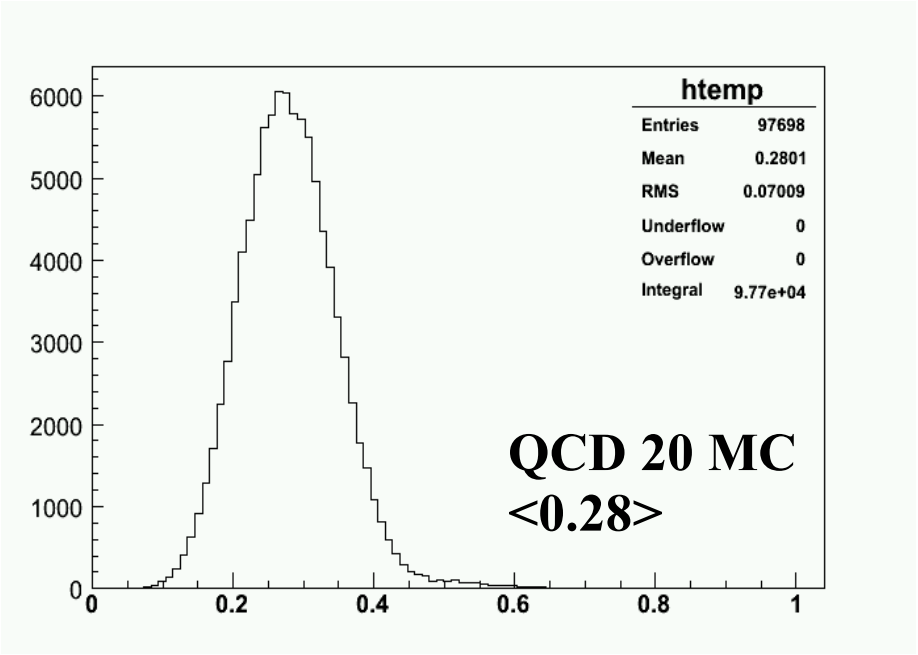
Of course, this correction fails on a different pt spectrum, like Z->bb

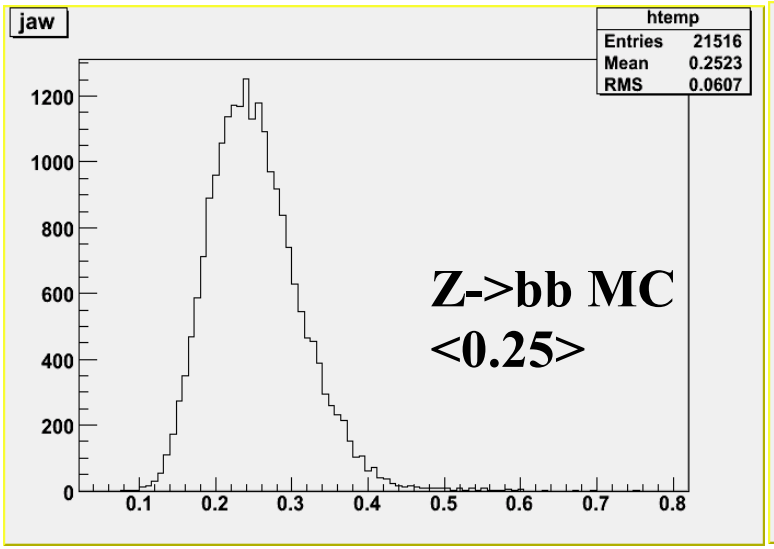


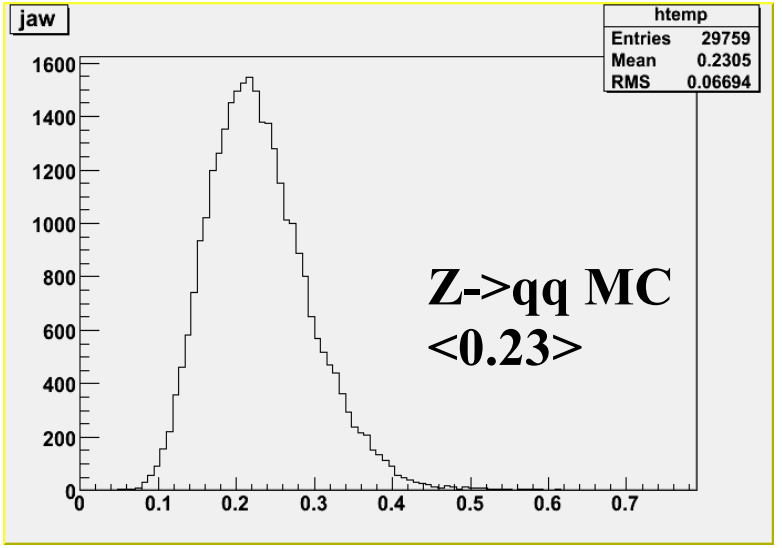
Jet Width

Actually, I think jet width will be more useful as a way to tell b-jets from light quark and gluon jets

Gluons are wider, and light quarks are thinner than b-jets...



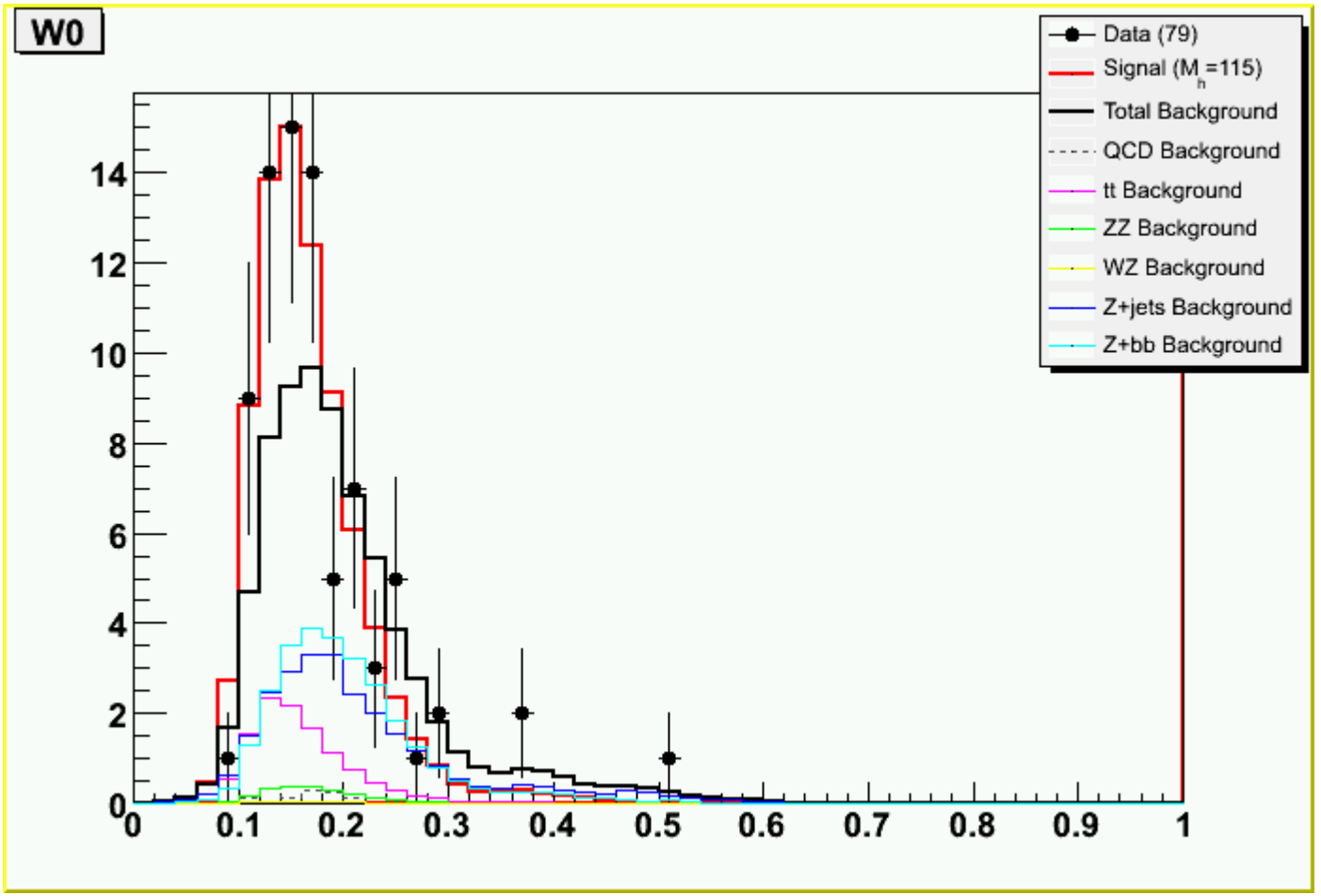




Jet Width

Width of leading pt jet in Z->mumubb analysis

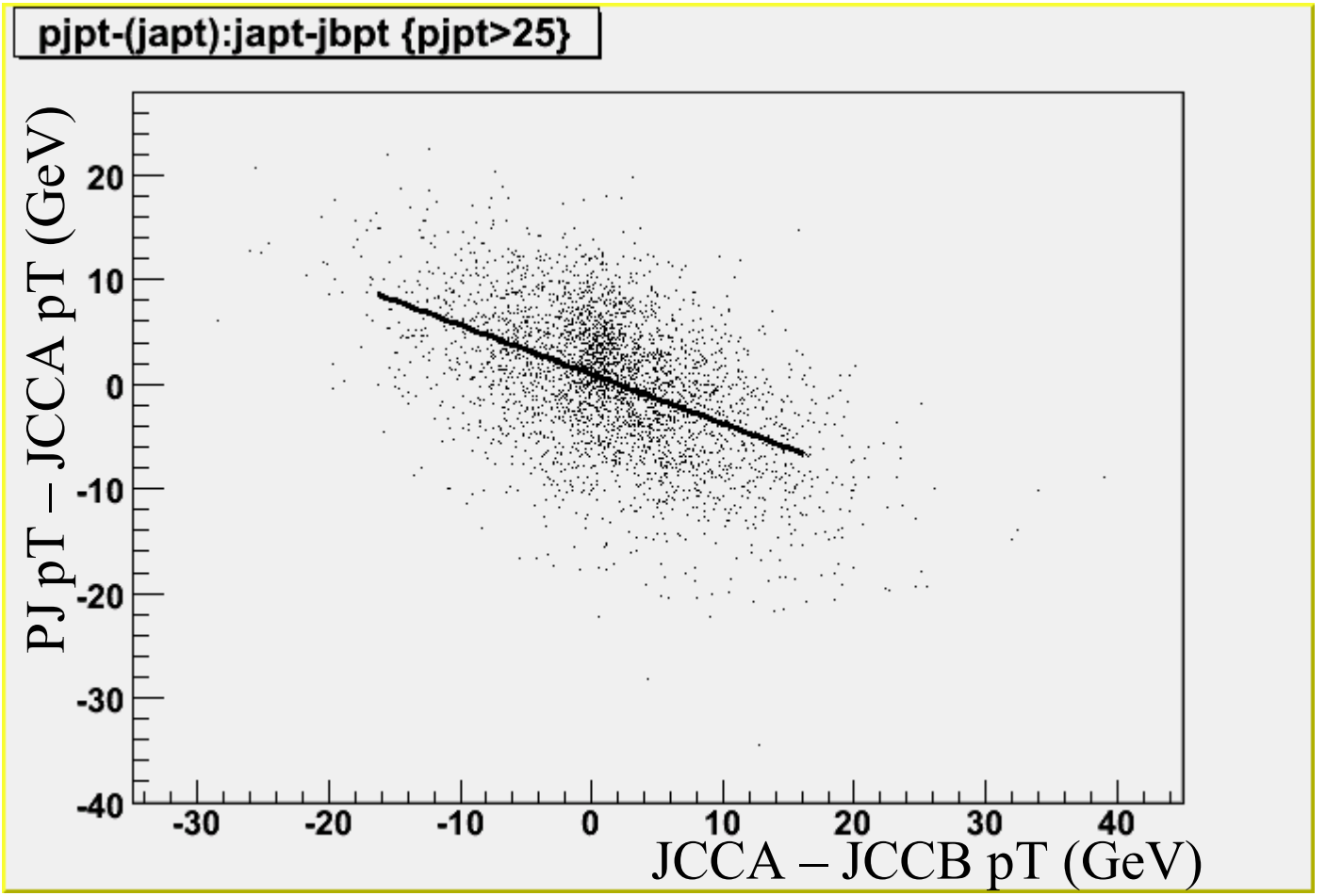
A lot of the b-tagged background is g->bb, which is wider!



Using JCCB as well

I happened to make this plot:

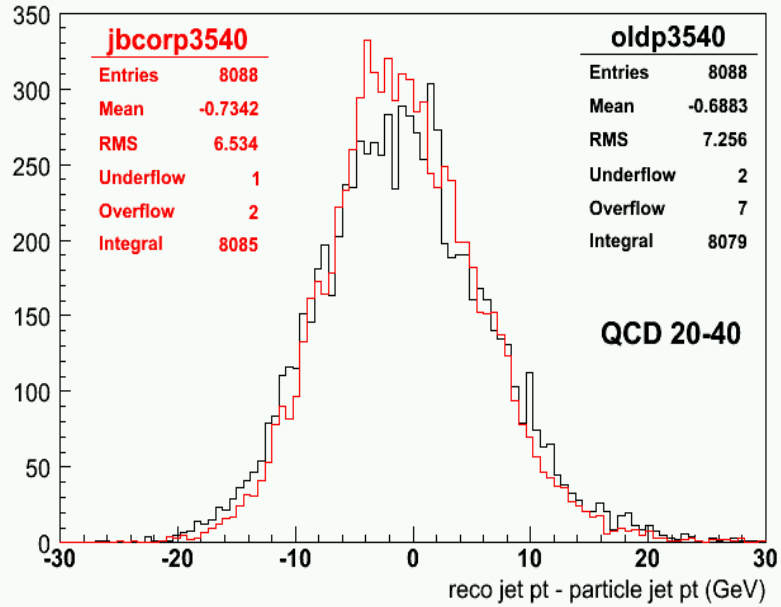
You can use a measurement of JCCB pT to correct the JCCA pT!



(JCCA+JCCB)/2

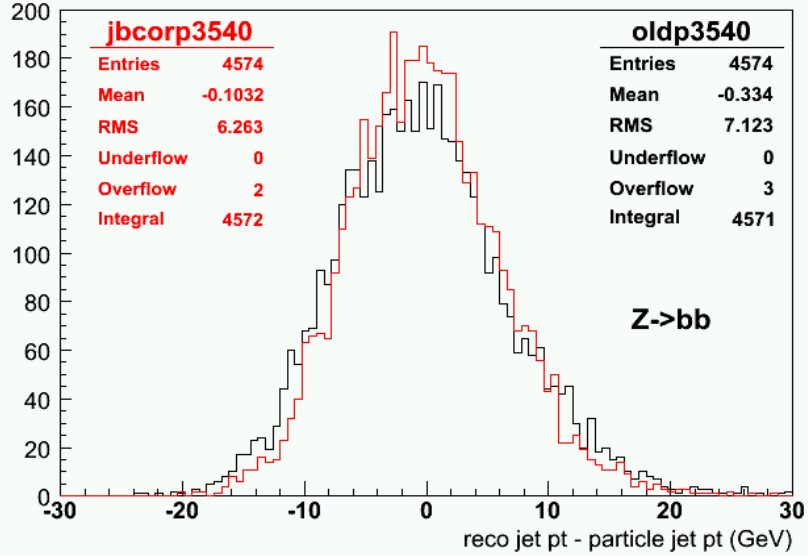
Can simply average the JCCA and JCCB jets' 4-vectors

~10% improvement



Works even a little better in Z->bb

~12 % improvement



Of course, there are more optimal ways of using the info than just averaging... training a NN...