

Pixel-only tracking / b-tagging in 422

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DESY

Tk upgrade simulation meeting, 25.5.11

Switching to 422 / 423

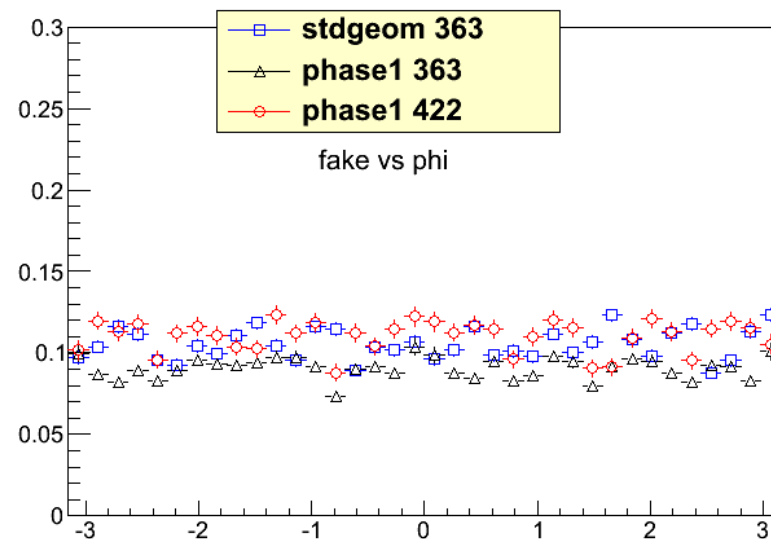
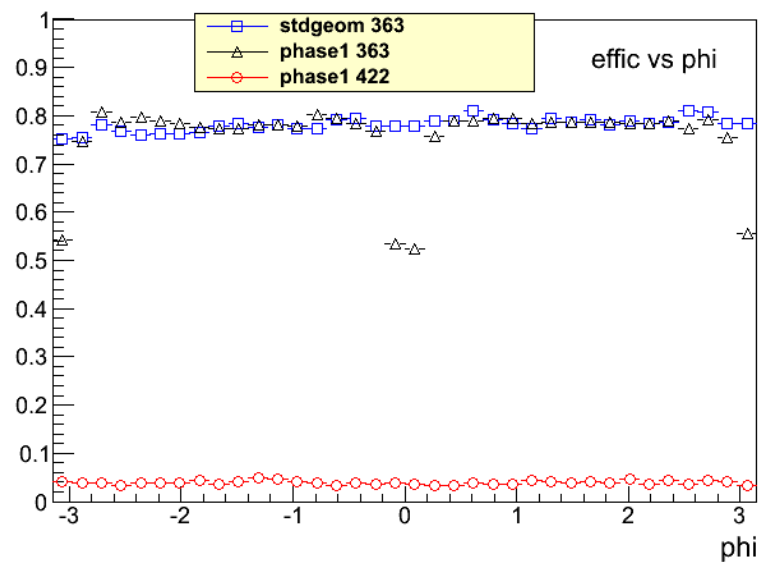
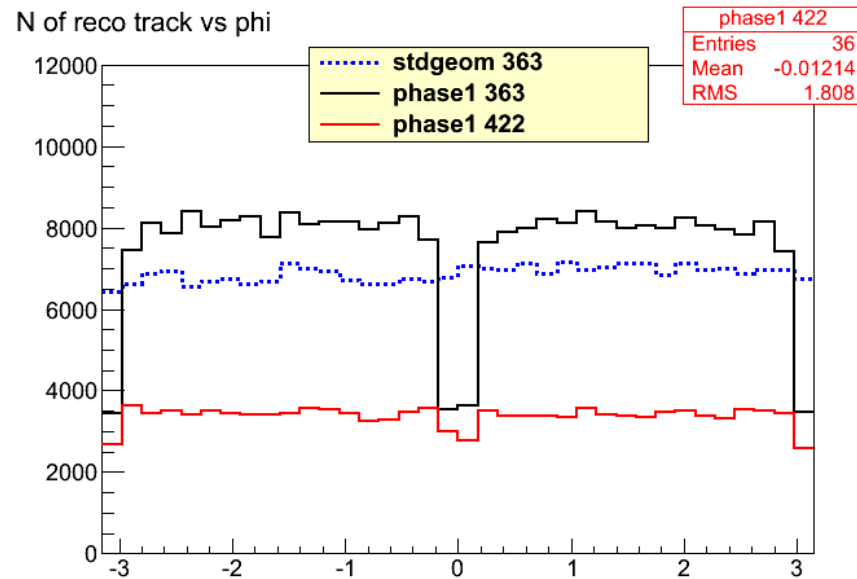
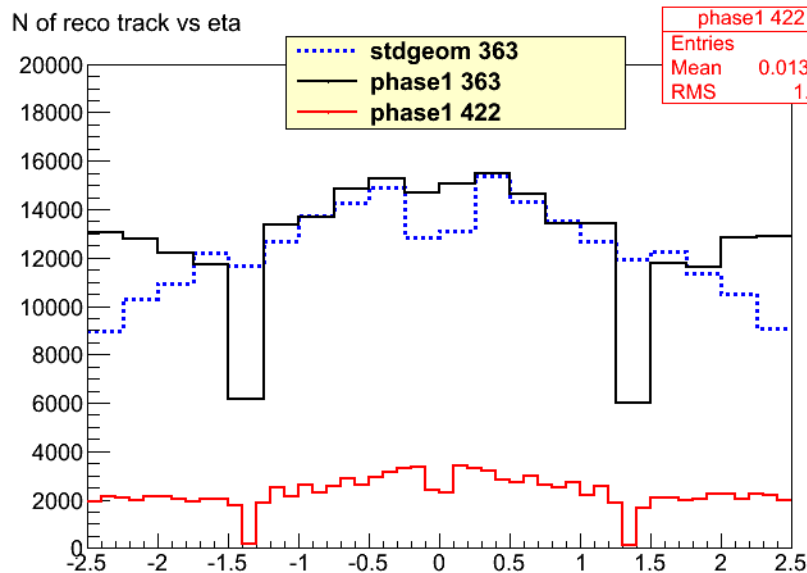
Currently using 422_SLHC_pre1, will switch now to 423

Some modifications –

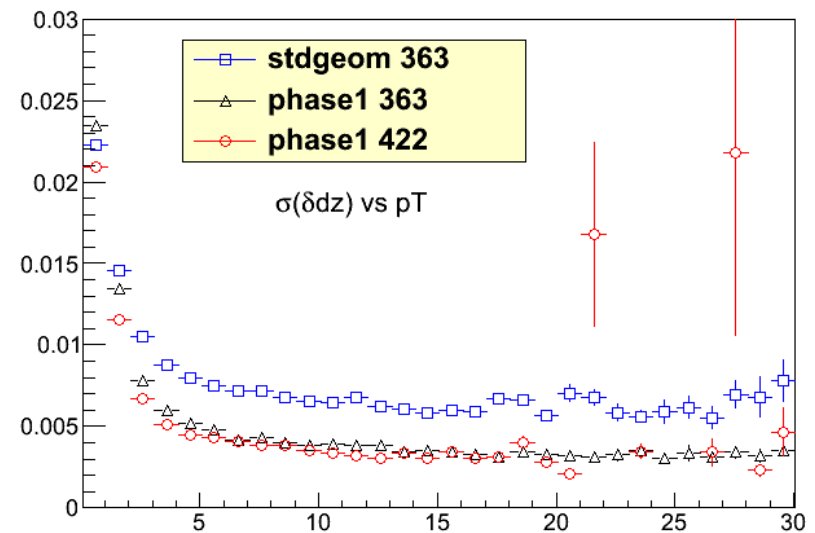
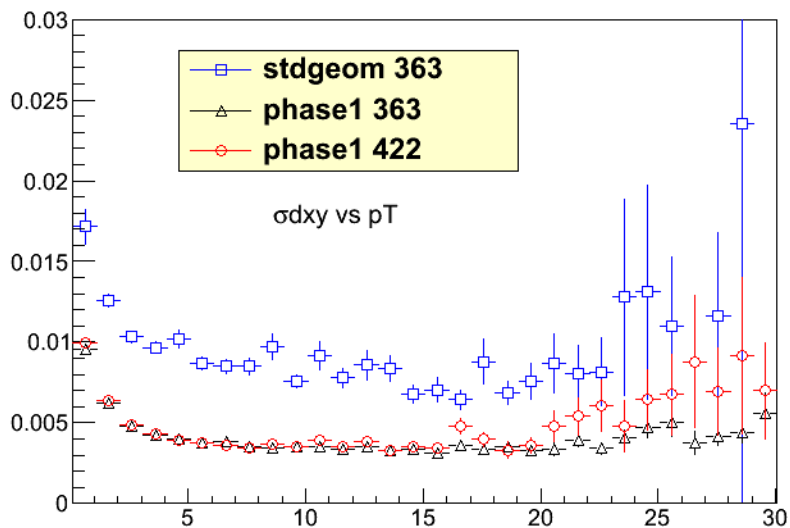
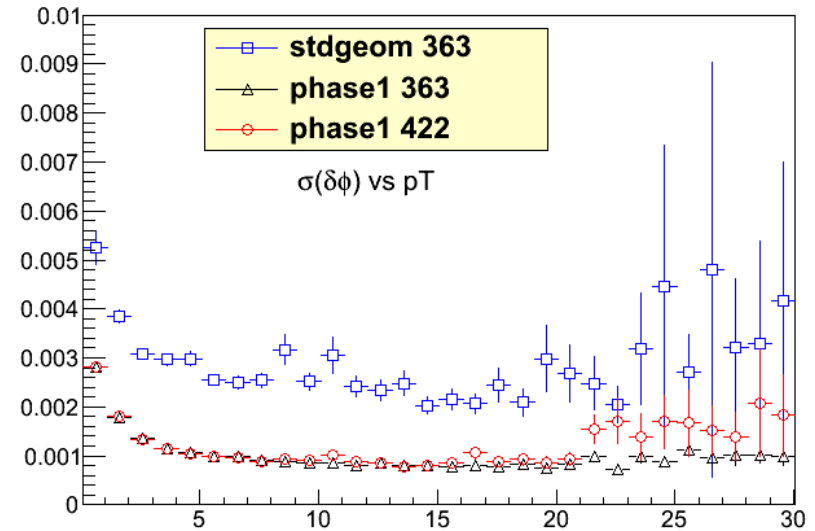
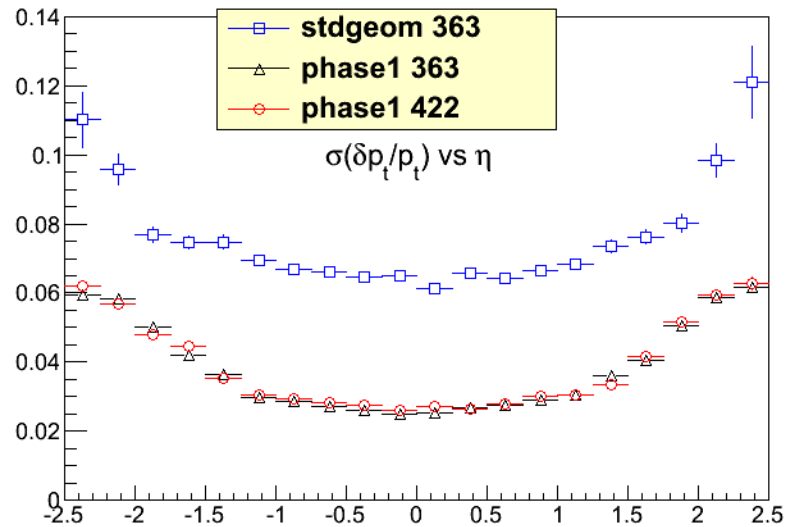
- re-upgraded the tracking code to catch up with recent changes, one minor bug fixed (came up with new compiler)
- QuadrupletSeedMerger seems to work as-is
- Reworked the HLT cfg (now HLT_GRun_cff): completely new BTagIP trigger paths, but reco sequences basically the same, some missing parameters fixed, new TTRHBuilders, ...
- Using gaussian vertex smearing, but set $\sigma_z = 0$ (see later slide)
- stdgeom (plain 423) not yet set up

Efficiencies & fake rates

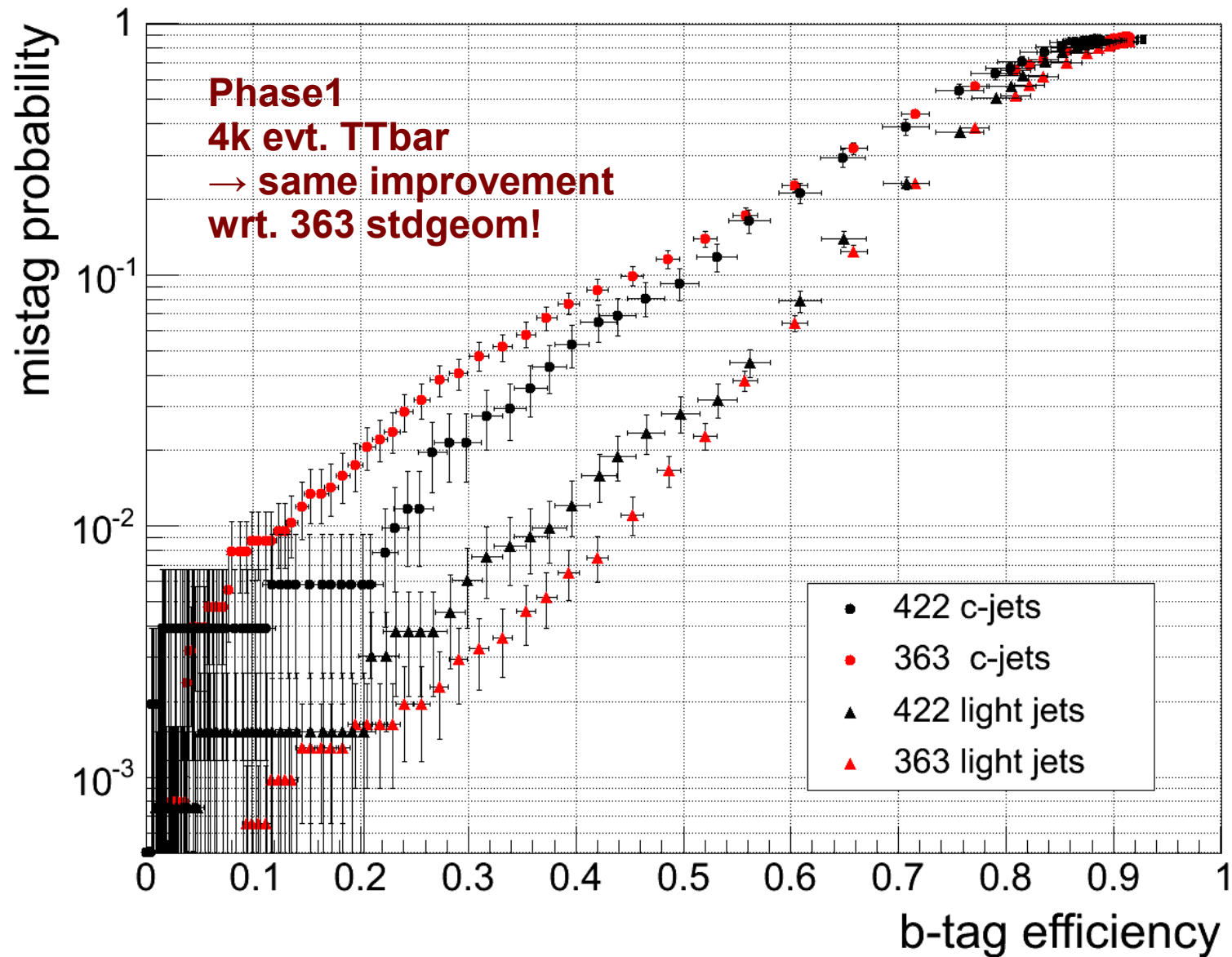
MultiTrackValidator / quickTrackAssociatorByHits



Track properties

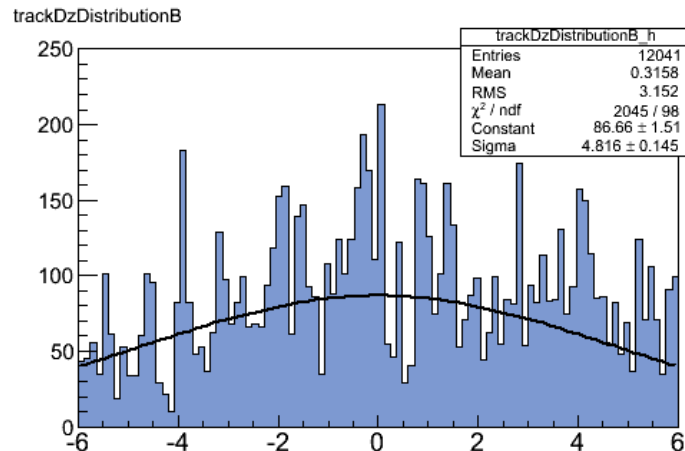


B-tagging performance



Problems with vertex smearing & PU

Had to set vertex smearing $\sigma_z = 0$ in GEN-SIM step (same as for 363)



GaussVtxSmearingParameters = cms.PSet(
[...]
SigmaY = cms.double(0.0015),
SigmaX = cms.double(0.0015),
SigmaZ = cms.double(5.3)
[...])

RecoBTag/ImpactParameter/plugins/TrackIPProducer.cc

```
// use first pv of the collection
Vertex dummy;
const Vertex *pv = &dummy;
edm::Ref<VertexCollection> pvRef;
if (primaryVertex->size() != 0) {
    pv = &*primaryVertex->begin();
    // we always use the first vertex (at the moment)
    pvRef = edm::Ref<VertexCollection>(primaryVertex, 0);
}
```

- Always takes the first vertex and uses it as reference for IP calculation
- might be the wrong PV and then its position is arbitrary
- In case of large vtx smearing or PU: **creates large fake z-IP**

Will investigate this further, maybe use a different PV finder algorithm, but it seems that this has to be updated for PU (also for stdgeom)