State of the art: pixel upgrade simulation

• Successfully implemented quadruplet seed merger for HLT and iterative tracking

• Significant improvement in 4-hit pixel only tracking, but not propagating to b-tagging efficiency

• Toy track-counting 3D high efficiency tagger shows improvement → current geometry in CMSSW is implicitly hard-coded in more places → work in progress

• Significant improvement in seeding performance using quadruplets, especially for pile up

- **New track fit algorithms & quadruplet seed merger code are part of the Official CMSSW upgrade releases since CMSSW_3_6_3_SLHC1**

  Fully developed by J.O & M. A.

  https://twiki.cern.ch/twiki/bin/viewauth/CMS/SLHCTrackerDESYSimTools

- **All simulation efforts will be based on these quadruplets from now on**

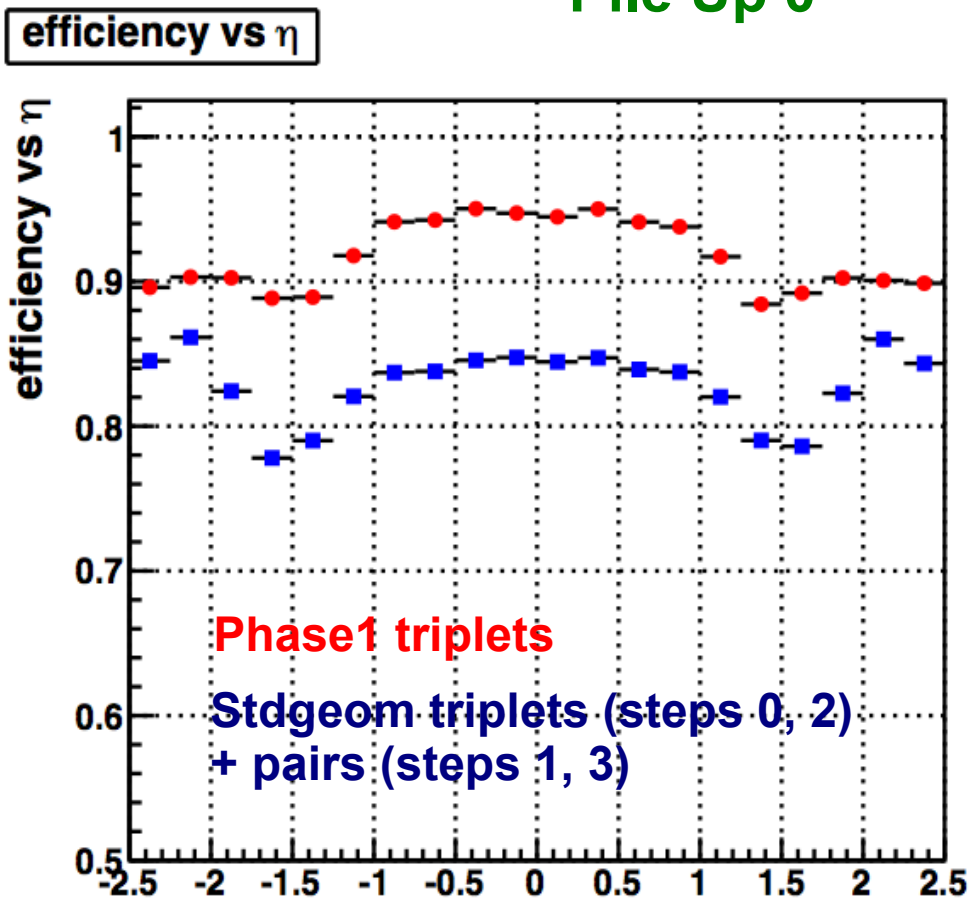
- **We have taken over the coordination of the Release Validation of the (complete) Upgrade Project**

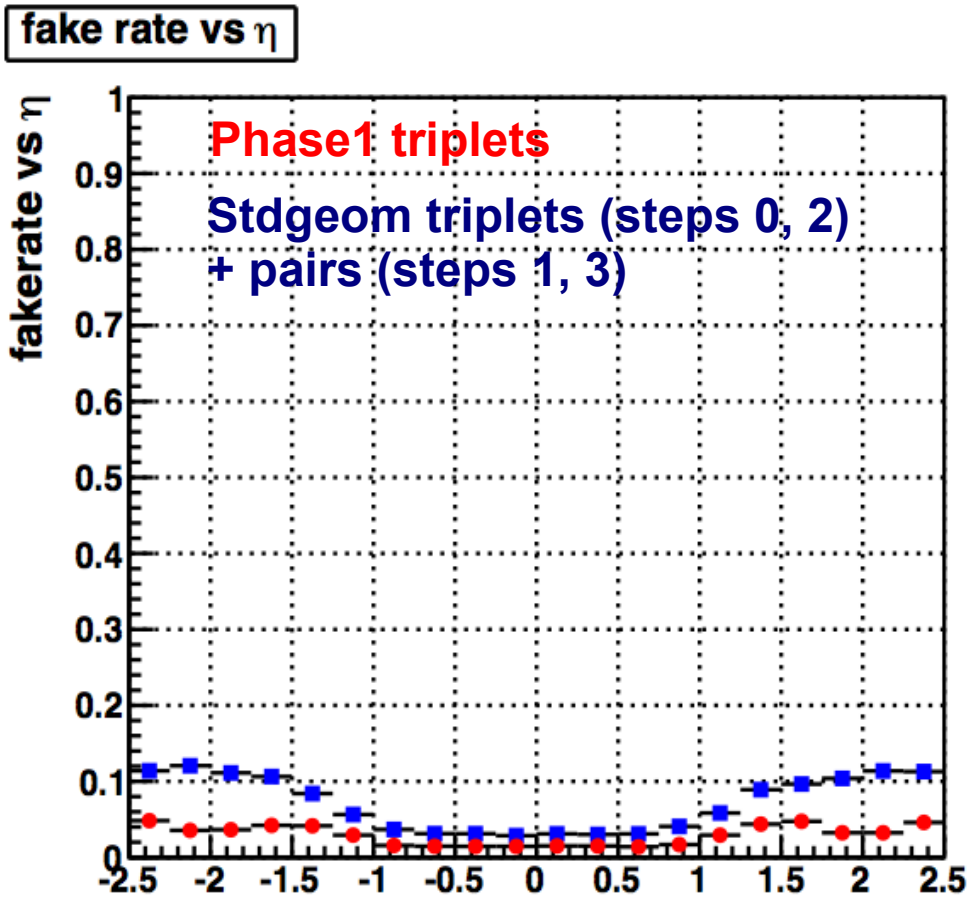
  https://twiki.cern.ch/twiki/bin/view/CMS/DQMforMCforSLHC

State of the art: Seeding in iterative tracking

Combined (final) seeds after 4 iterative steps

Pile Up 0

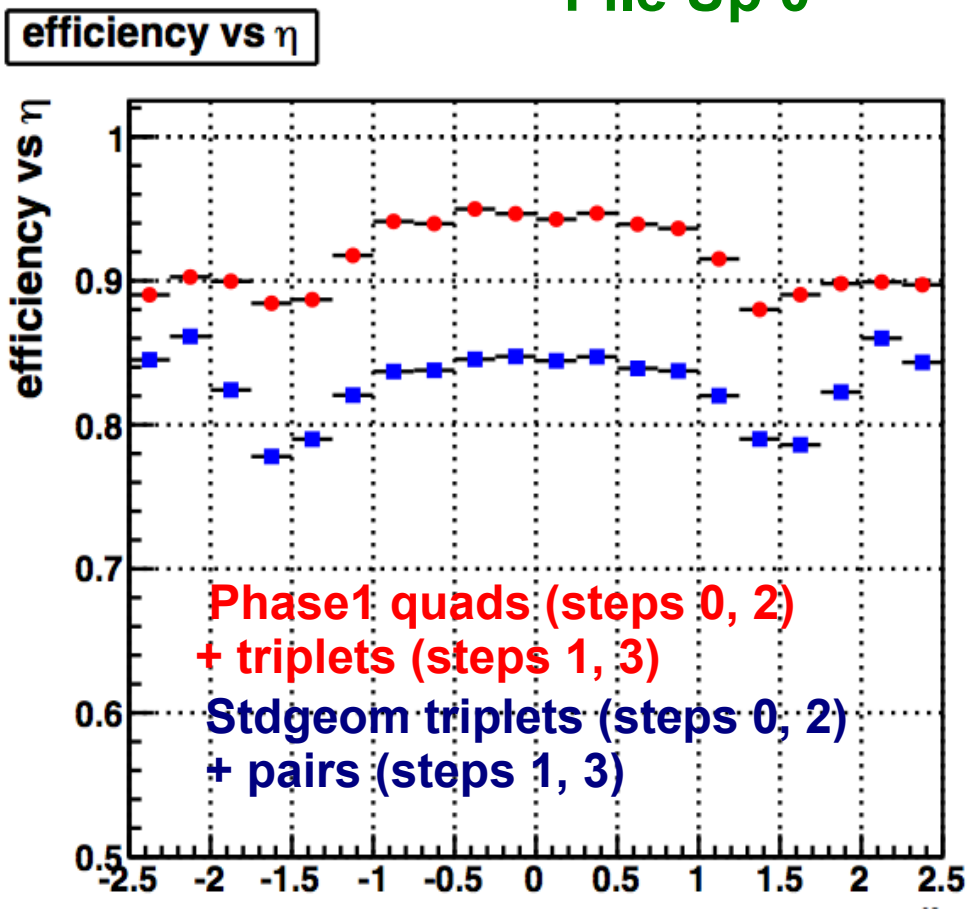


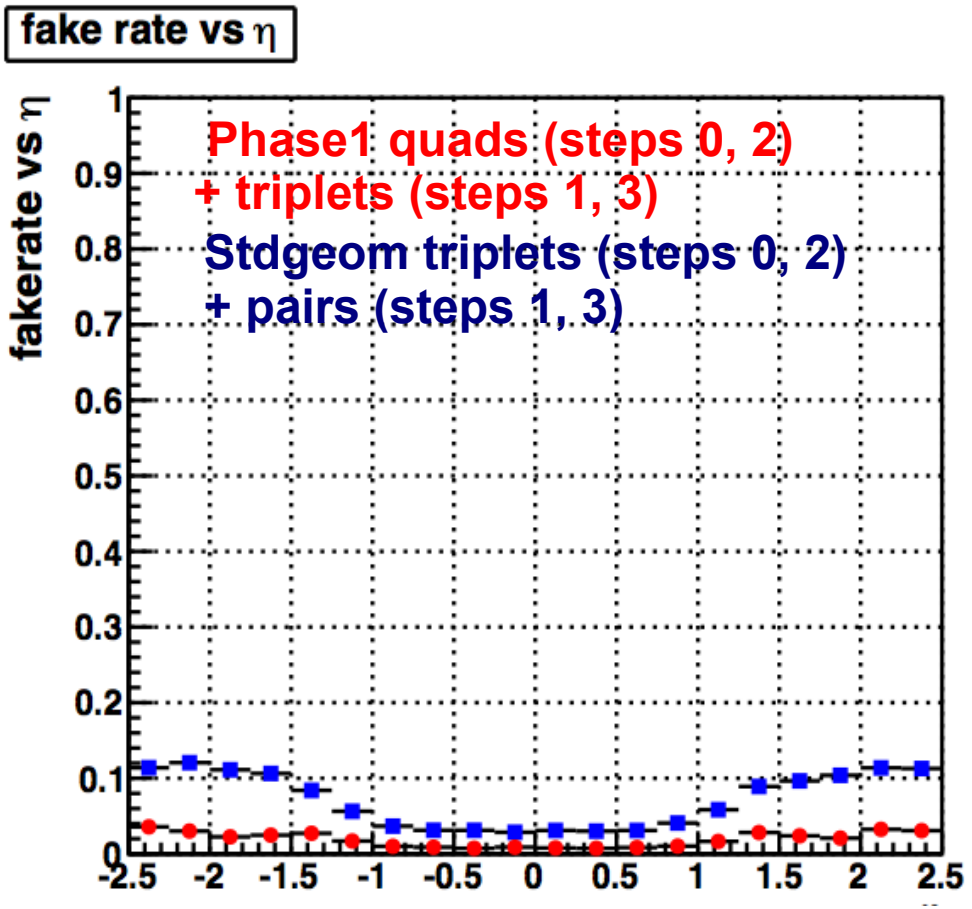


State of the art: Seeding in iterative tracking

Combined (final) seeds after 4 iterative steps

Pile Up 0

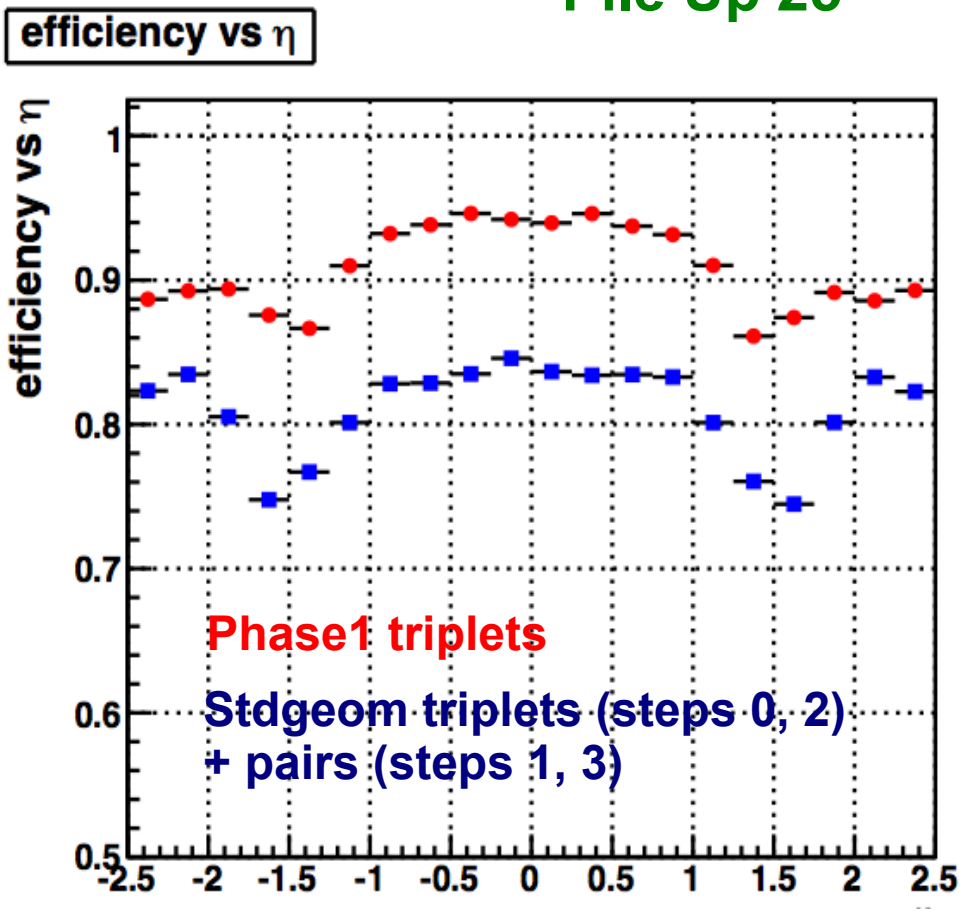


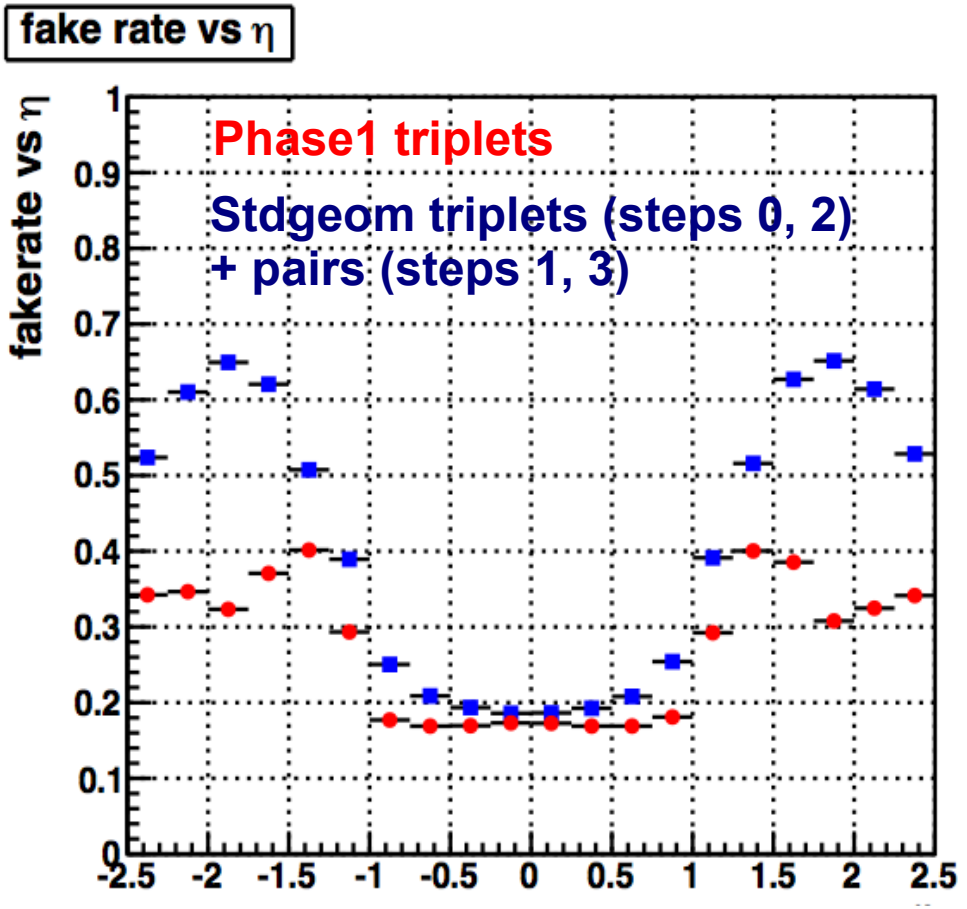


State of the art: Seeding in iterative tracking

Combined (final) seeds after 4 iterative steps

Pile Up 25





State of the art: Seeding in iterative tracking

Combined (final) seeds after 4 iterative steps

Pile Up 25