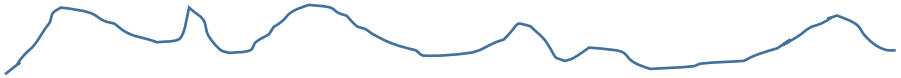
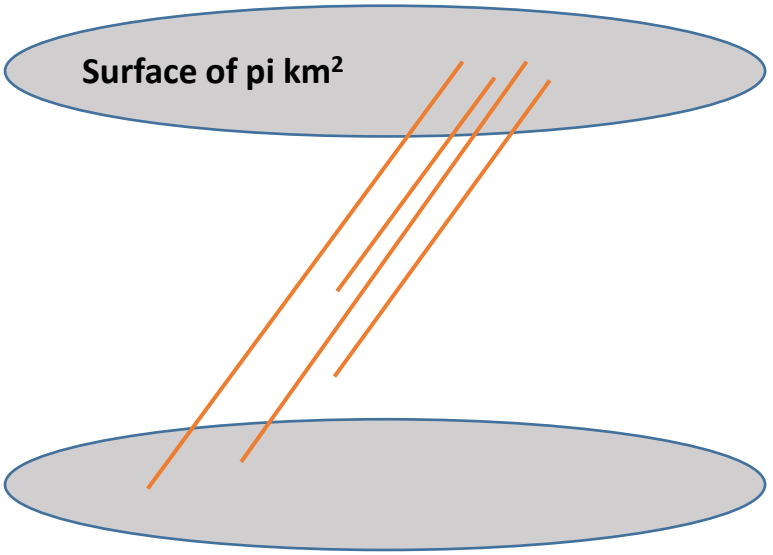
Mupage consistency study

Aart Heijboer



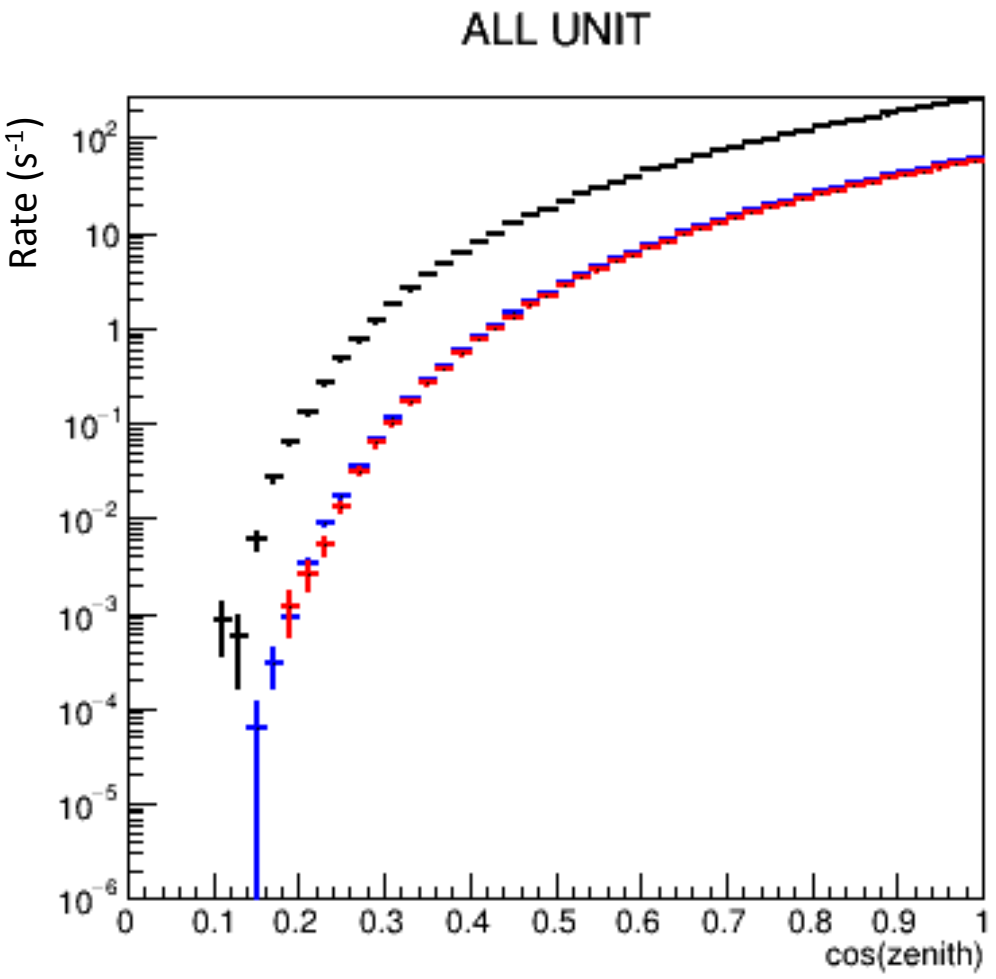


1. Run Mupage at 2 km depth
2. Record them.
3. Propagate the muons with Music

4. Record the muons surviving at 3km depth
5. Compare with running mupage @ 3km.
6. Compare.

Motivation: many discussion in km3net on mupage-based simulations that fail to describe the data.

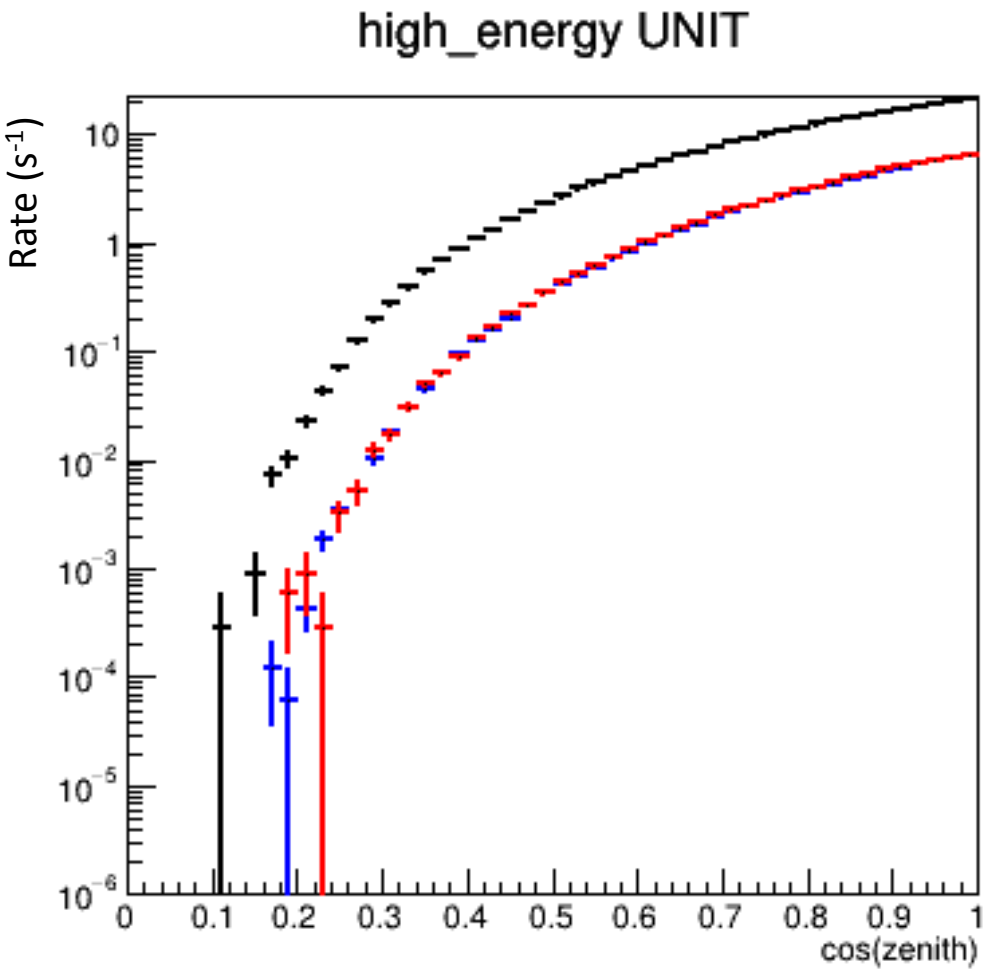
Mupage consistency study



--- mupage @ 2 km depth
--- mupage @ 3 km depth
--- Music to go from 2 to 3 km

All events

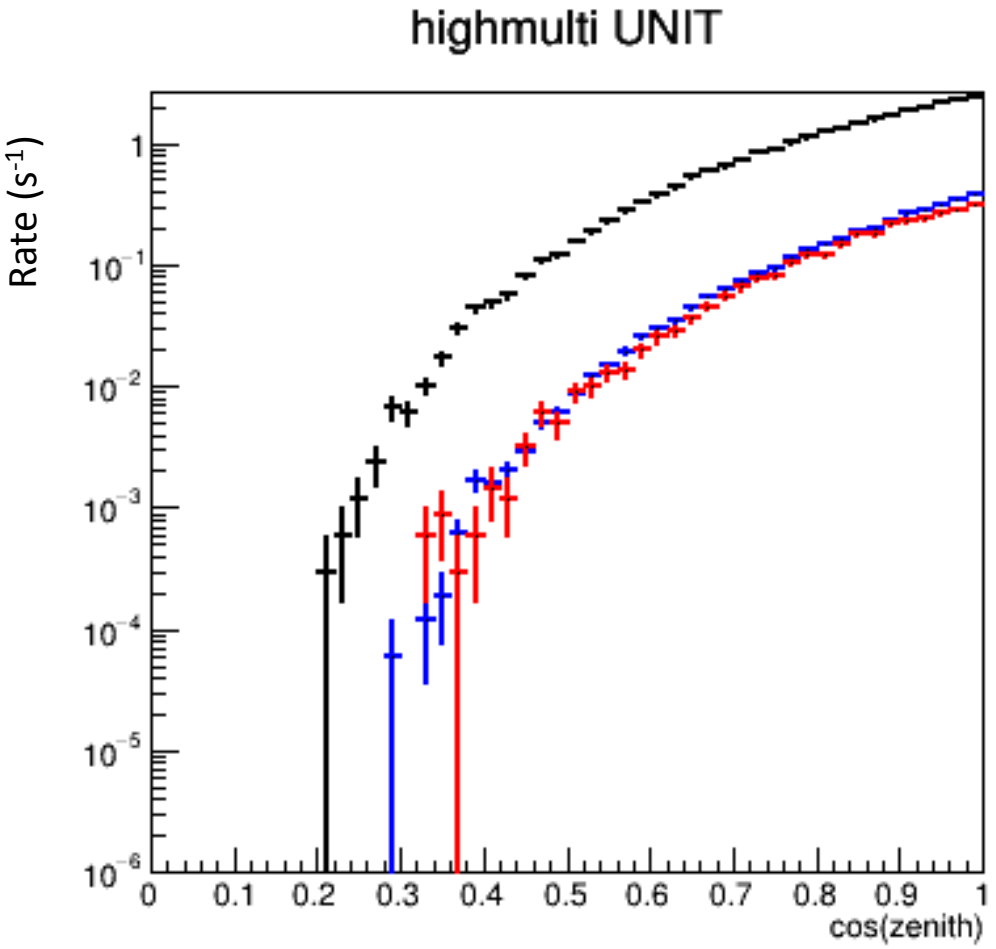
Mupage consistency study



--- mupage @ 2 km depth
--- mupage @ 3 km depth
--- Music to go from 2 to 3 km

High energy: Ebundle>TeV

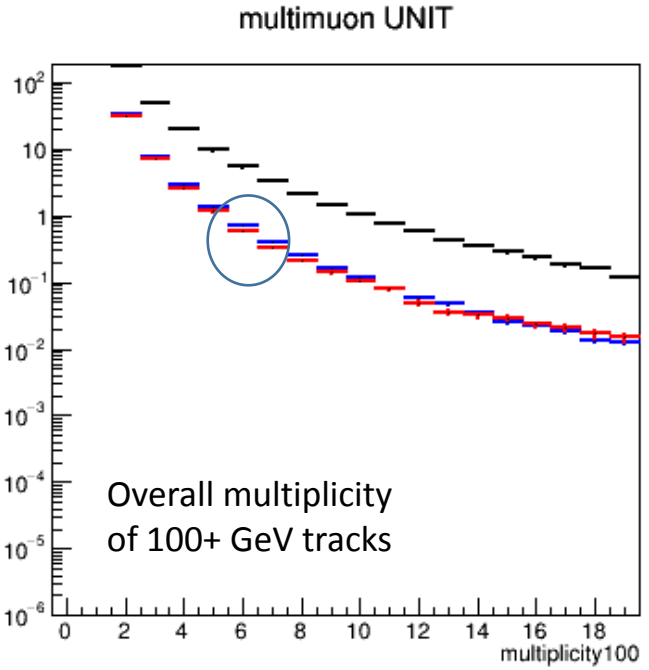
Mupage consistency study



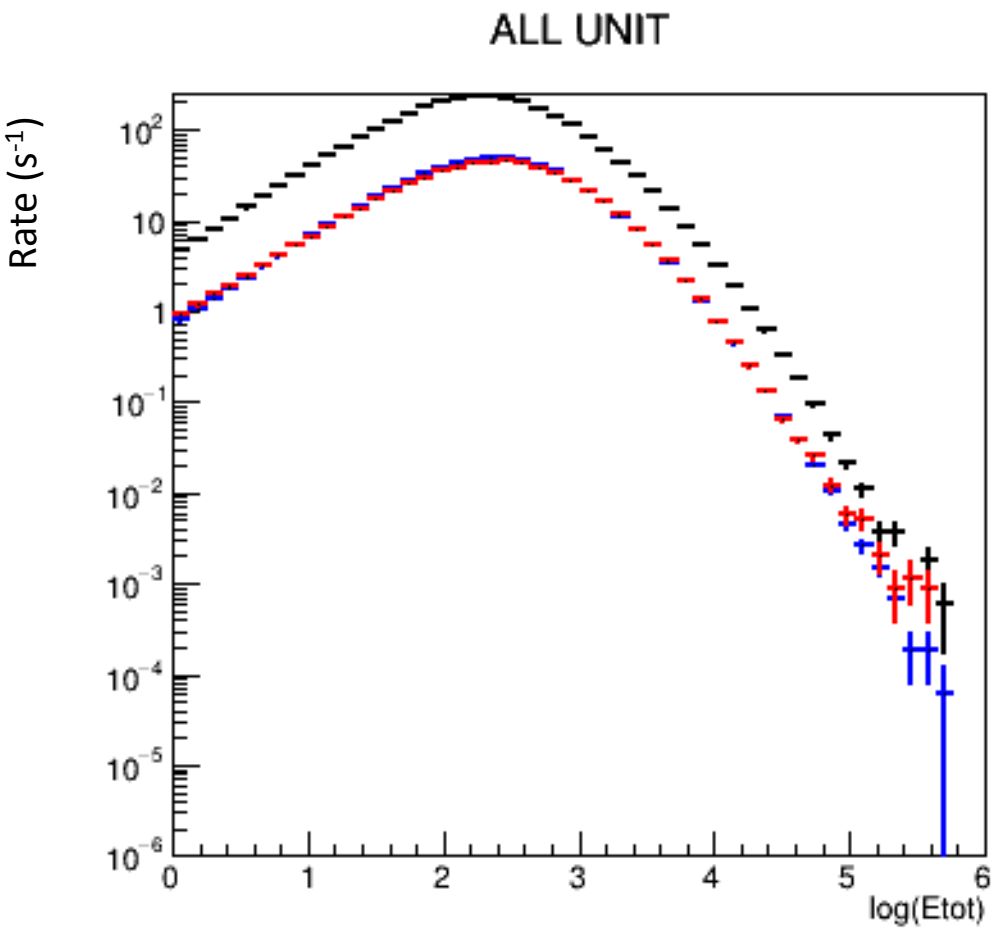
--- mupage @ 2 km depth
--- mupage @ 3 km depth
--- Music to go from 2 to 3 km

Events with 5 or more muons of 100 GeV or More in the bundle

Music propagation gives ~10% lower rate



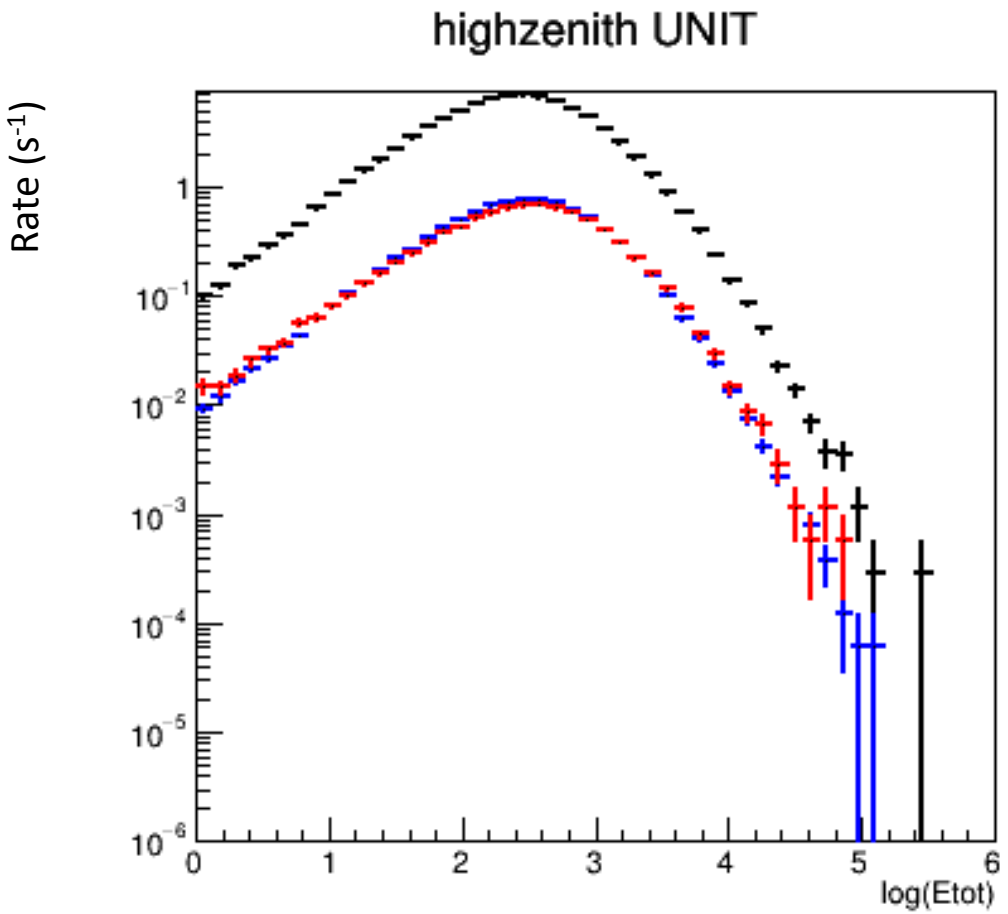
Mupage consistency study



--- mupage @ 2 km depth
--- mupage @ 3 km depth
--- Music to go from 2 to 3 km

All events

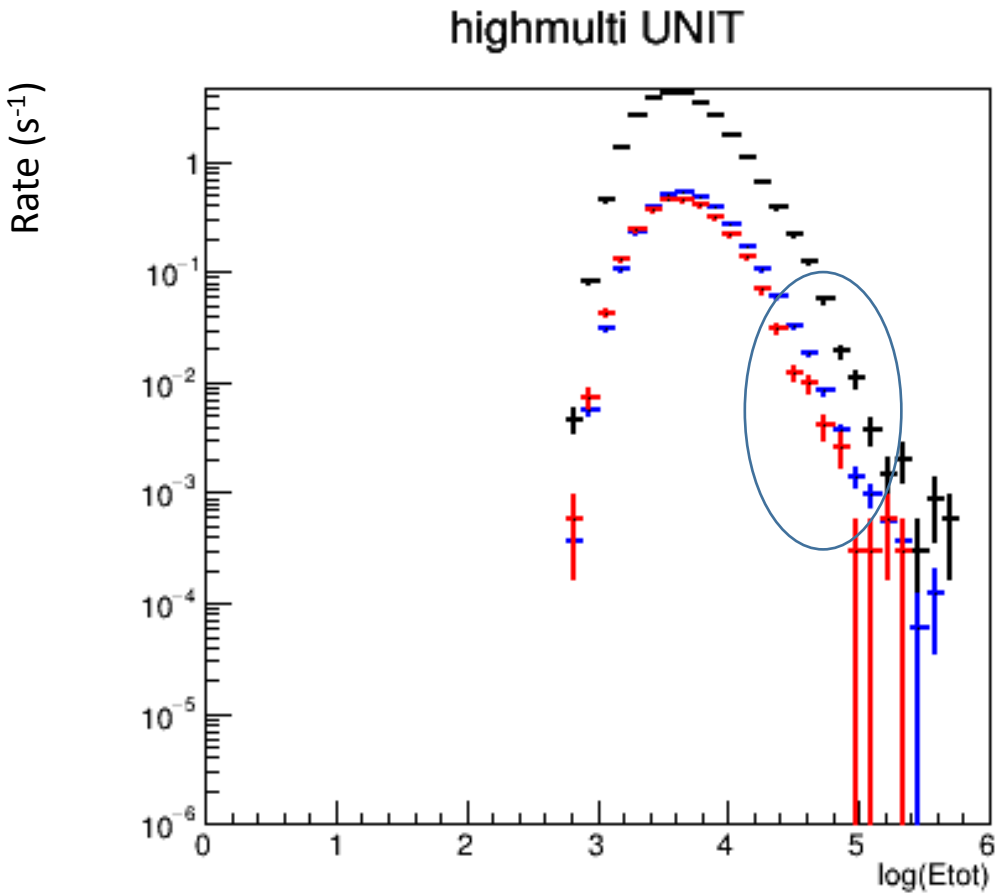
Mupage consistency study



--- mupage @ 2 km depth
--- mupage @ 3 km depth
--- Music to go from 2 to 3 km

Events with zenith angle > 60 deg

Mupage consistency study



--- mupage @ 2 km depth
--- mupage @ 3 km depth
--- Music to go from 2 to 3 km

Events with at least 5 100 GeV muons In the bundle.

For this specific class of events, mupage is over-predicting.

conclusions

- Mupage shows “good” internal consistency
  - To be honest: it does a lot better than I expected
- But high-energy large-multiplicity bundles show some issues
- Of course, ‘consistent’, does not mean ‘correct’
- Todo:
  - Think
  - Propagate for more than 1 km (mupage claims to be valid from 1.5 to 5 km depth)
- Also coming:
  - V2 of mupage that aims to drastically increase the execution speed