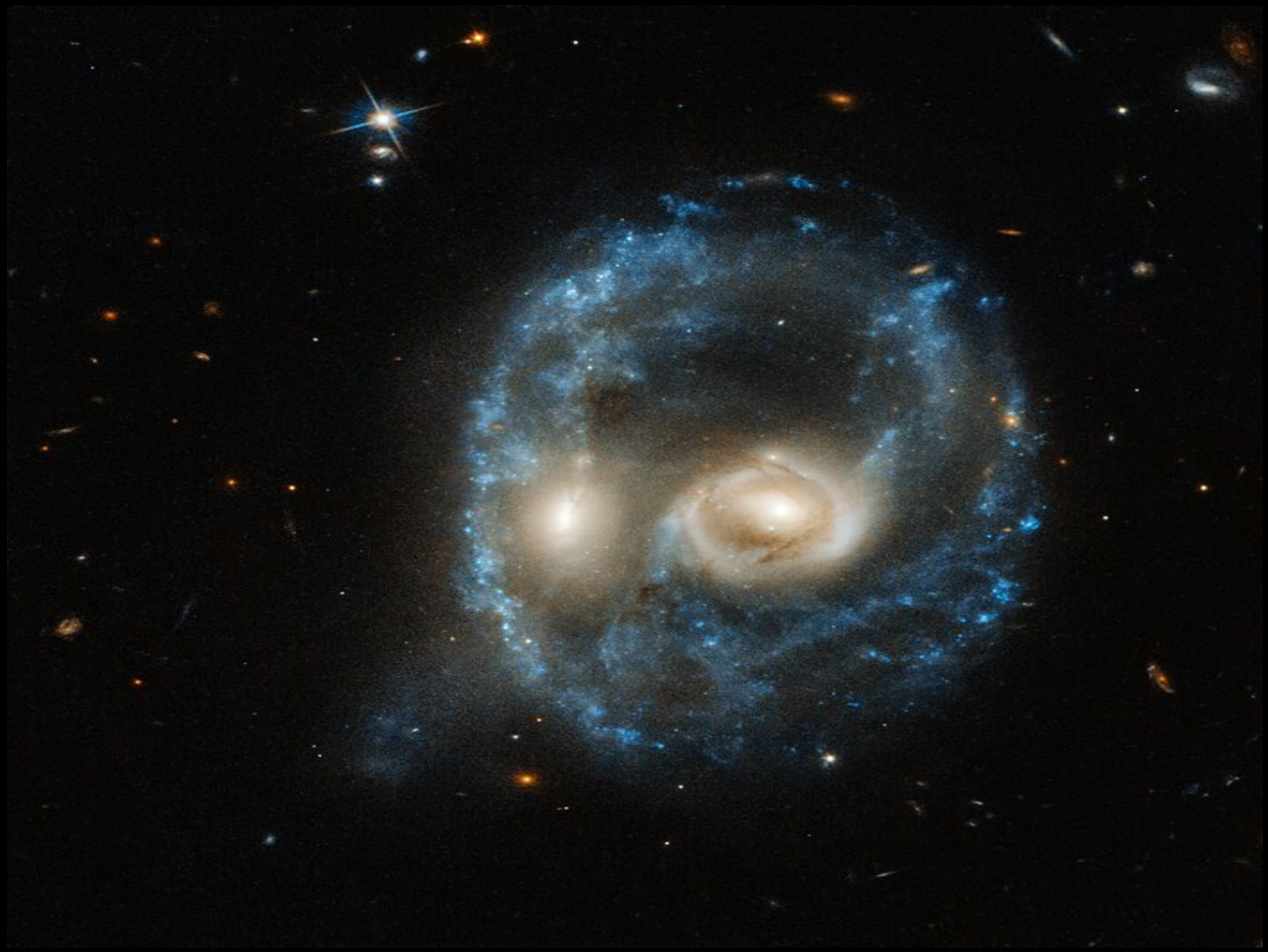
Group Meeting – 29/10/19

Happy Halloween!



Two galaxies merge 704 million light years away.

Credit: NASA, ESA

Energy Reco

- JPrefit → JGandalf → JStart → JGandalf gives an improved angular resolution in ORCA (i.e. using the track length in the hit selection)
- Check if the energy improves from this new chain.

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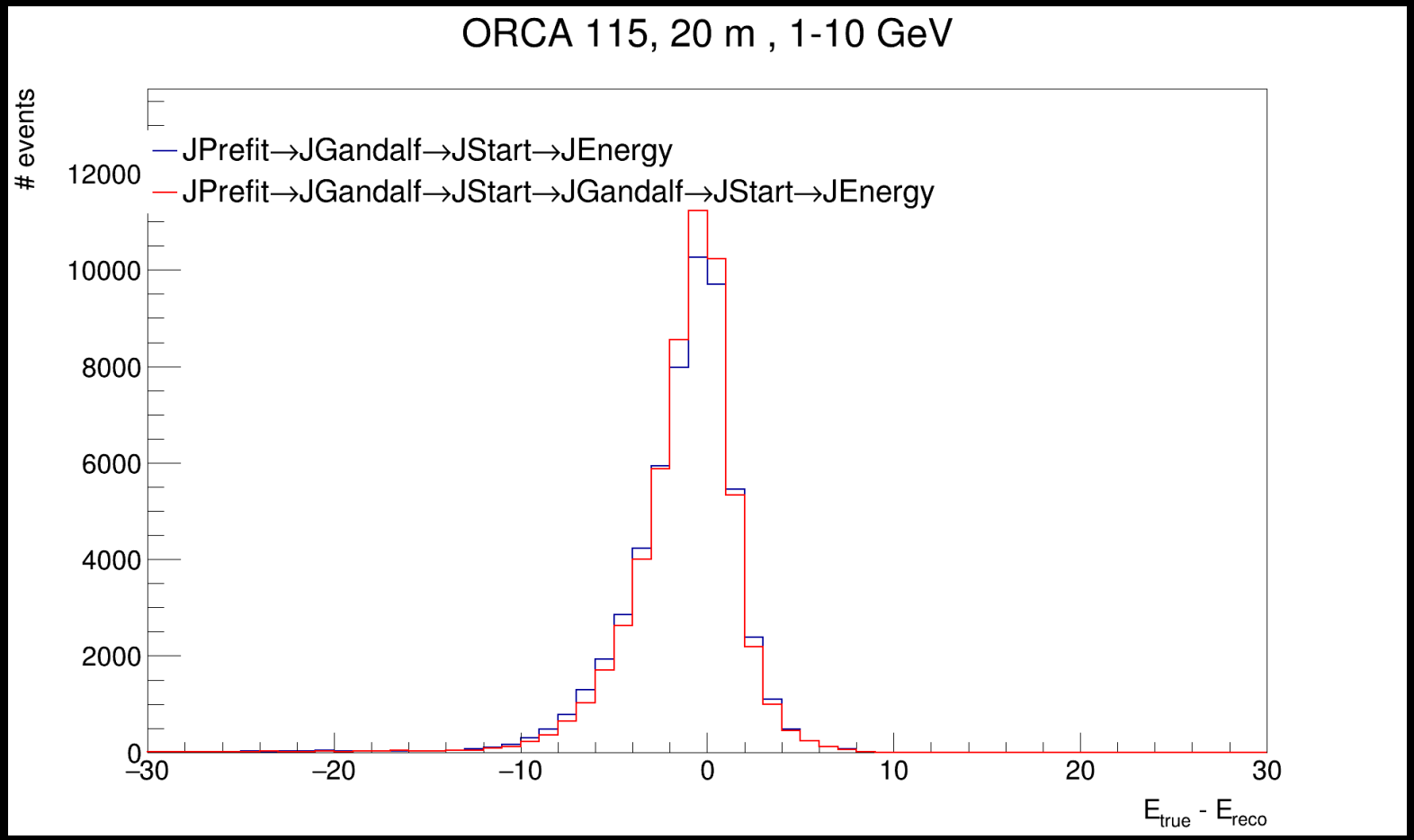
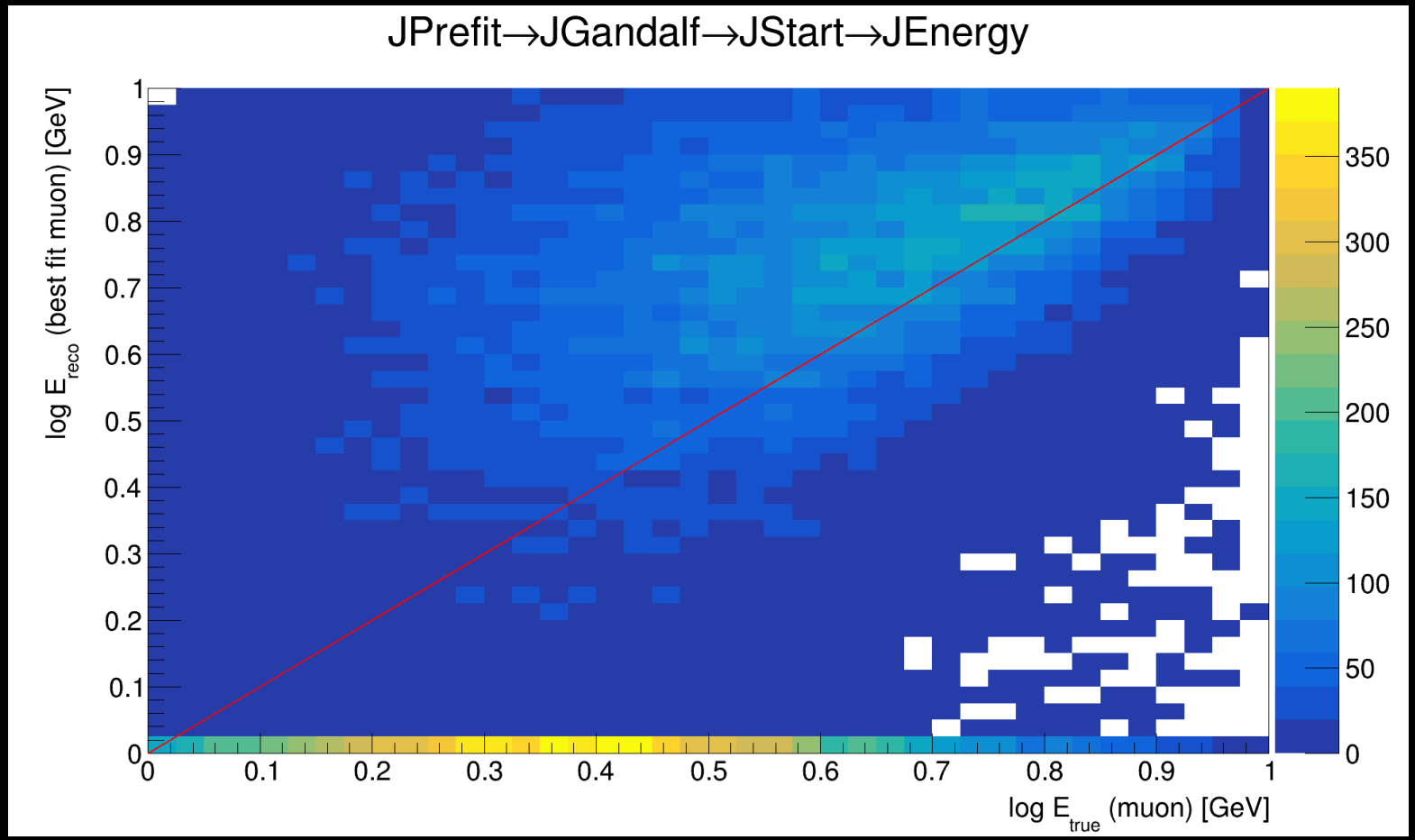
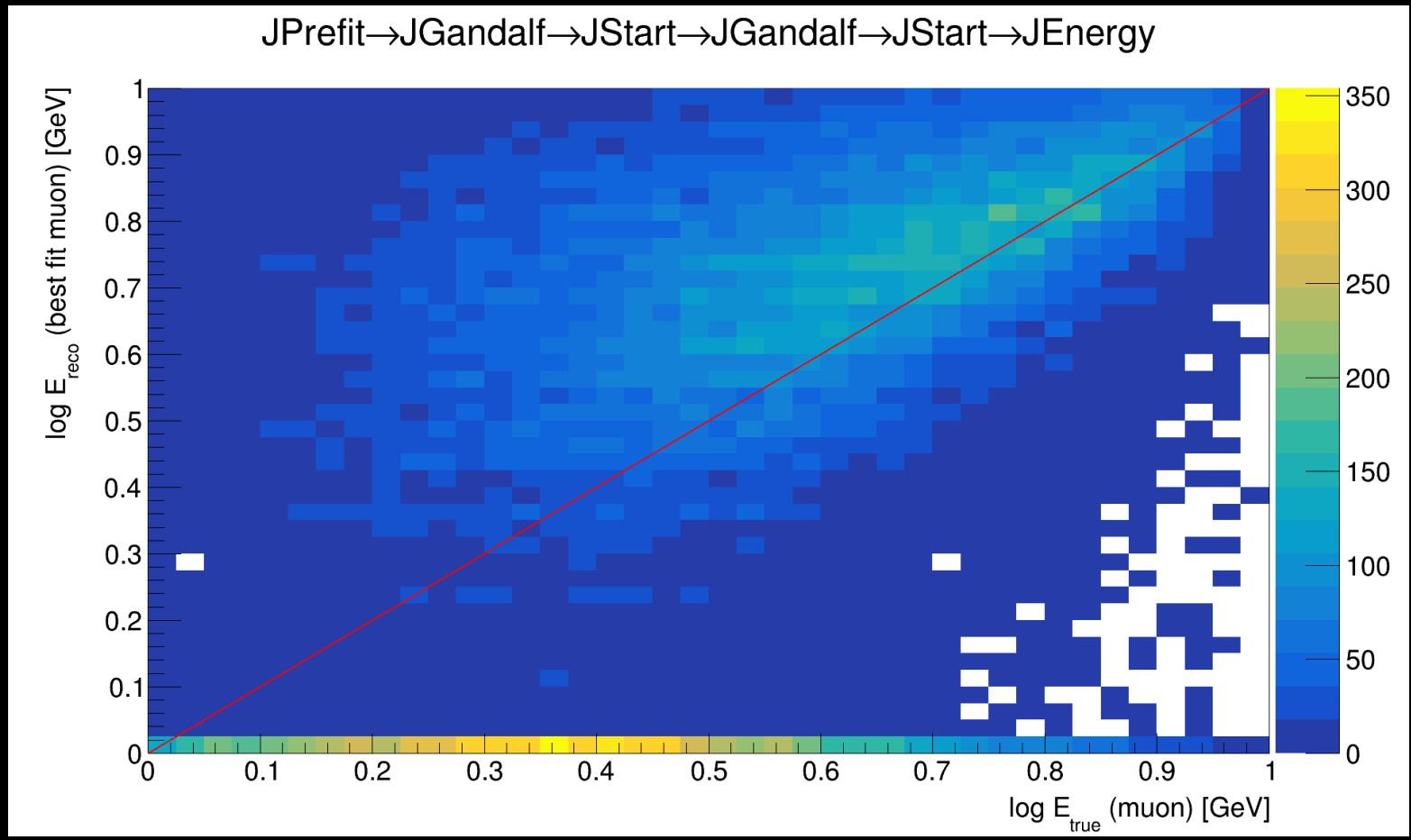
- JPrefit → JGandalf → JStart → JGandalf → JStart → JEnergy vs the usual JPrefit → JGandalf → JStart → JEnergy

For 1-10 GeV (where track length in JGandalf has the most impact):



Tiny improvement compared to regular reco chain?


JPrefit→JGandalf→JStart→JEnergy
log E_reco (best fit muon) [GeV]
log E_true (muon) [GeV]
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
50
100
150
200
250
300
350


JPrefit→JGandalf→JStart→JGandalf→JStart→JEnergy
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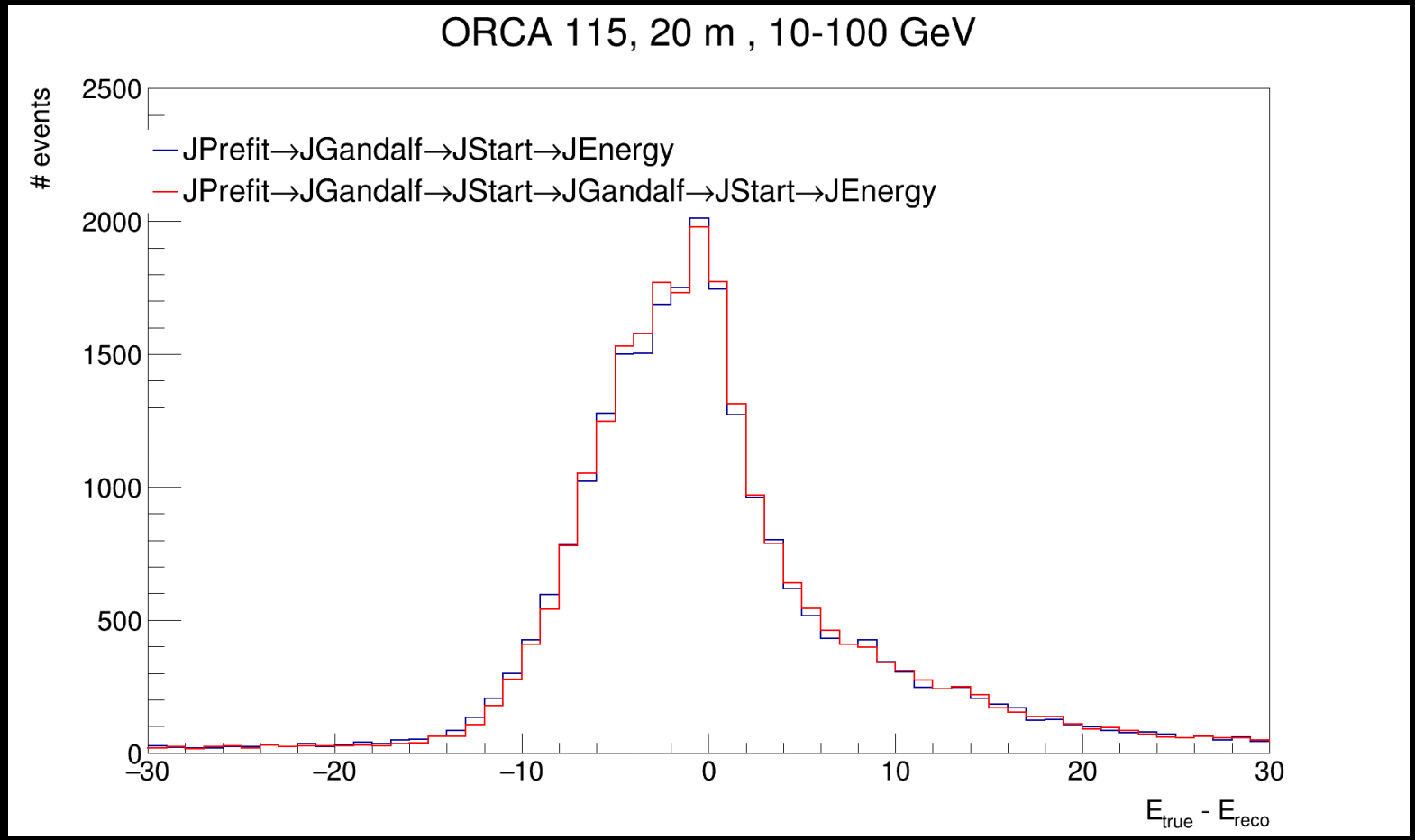
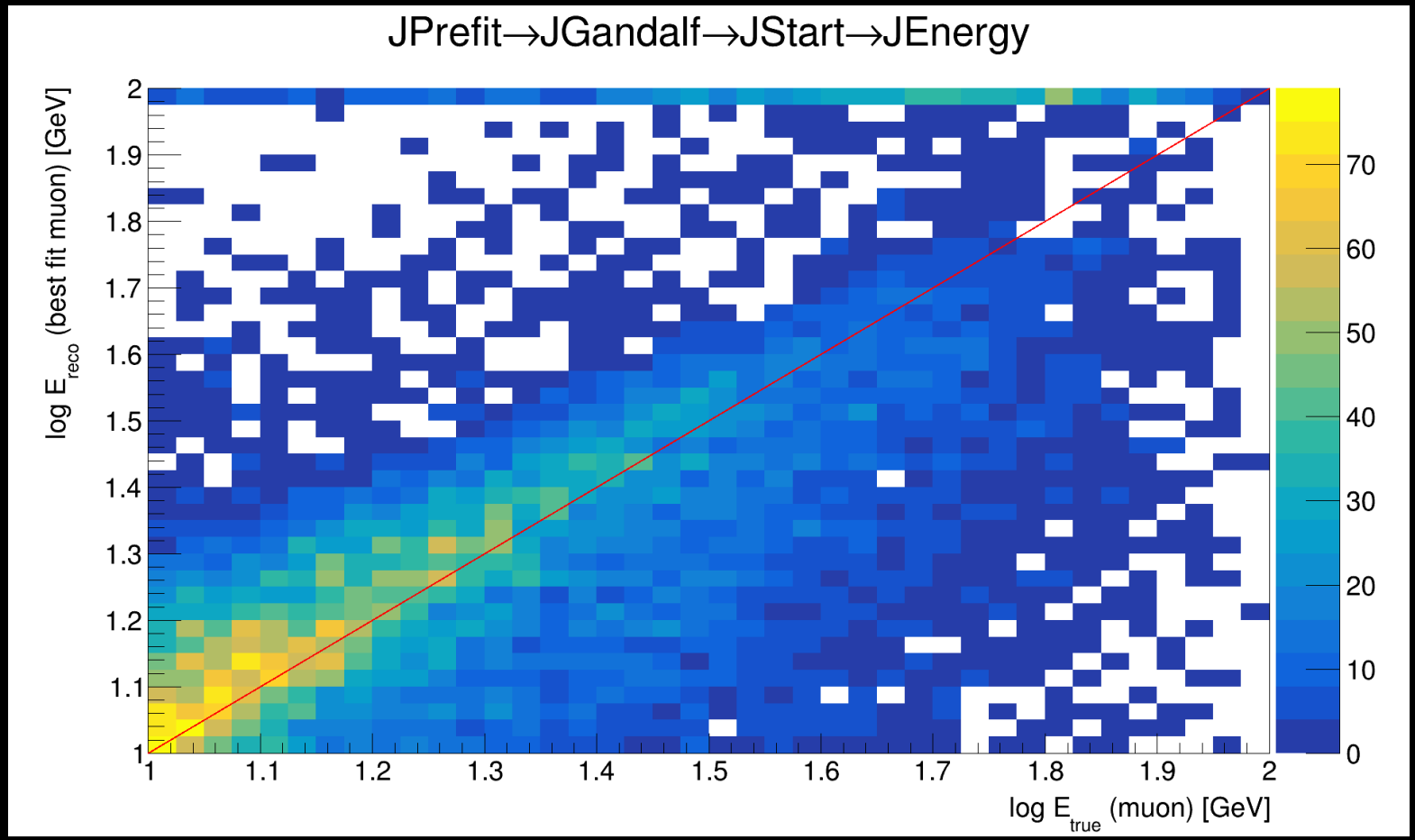
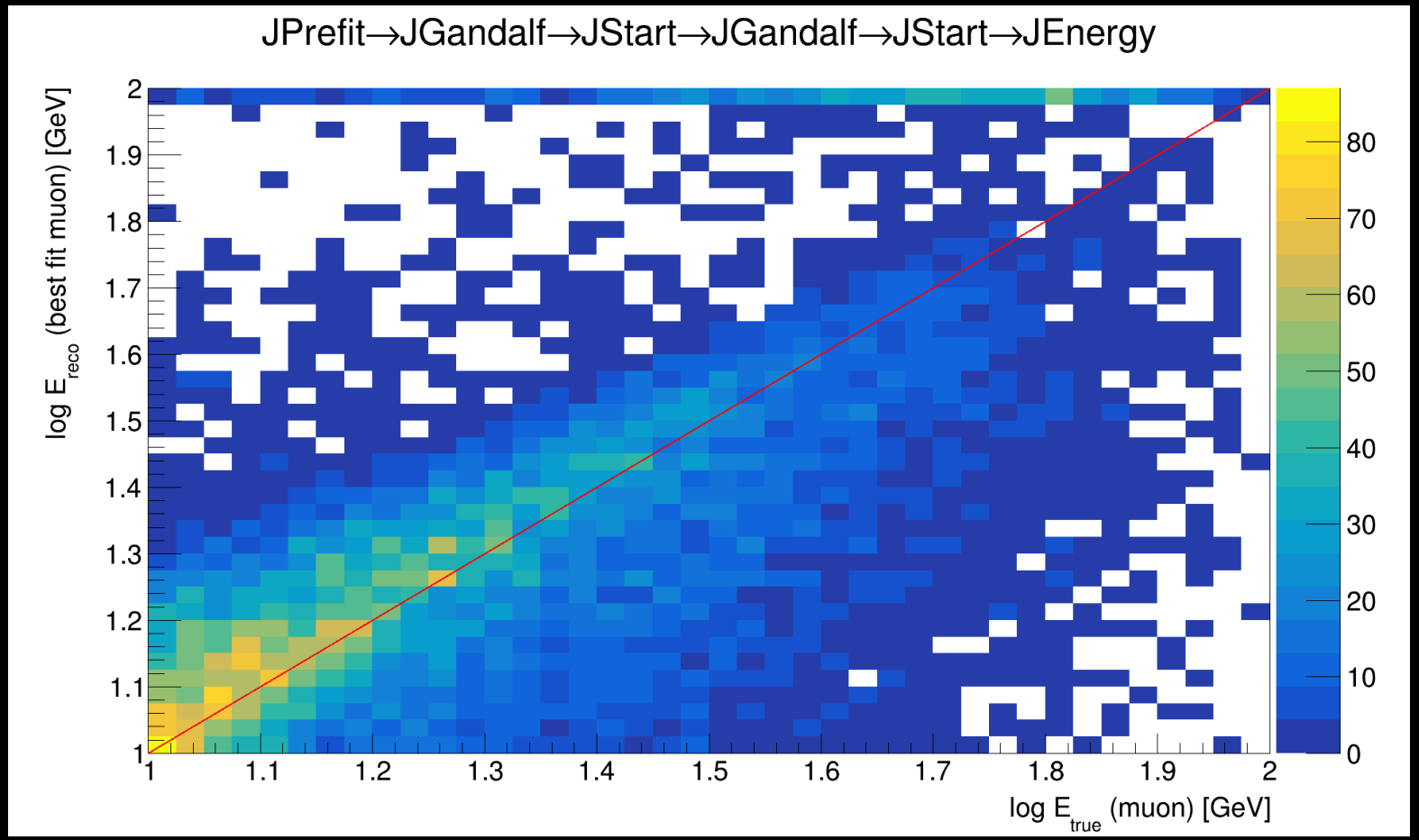
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
50
100
150
200
250
300
350

For 10-100 GeV:




JPrefit→JGandalf→JStart→JEnergy
log E_reco (best fit muon) [GeV]
log E_true (muon) [GeV]
2
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
1
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2
70
60
50
40
30
20
10
0


JPrefit→JGandalf→JStart→JGandalf→JStart→JEnergy
log E_reco (best fit muon) [GeV]
log E_true (muon) [GeV]
2
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
1
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2
80
70
60
50
40
30
20
10
0

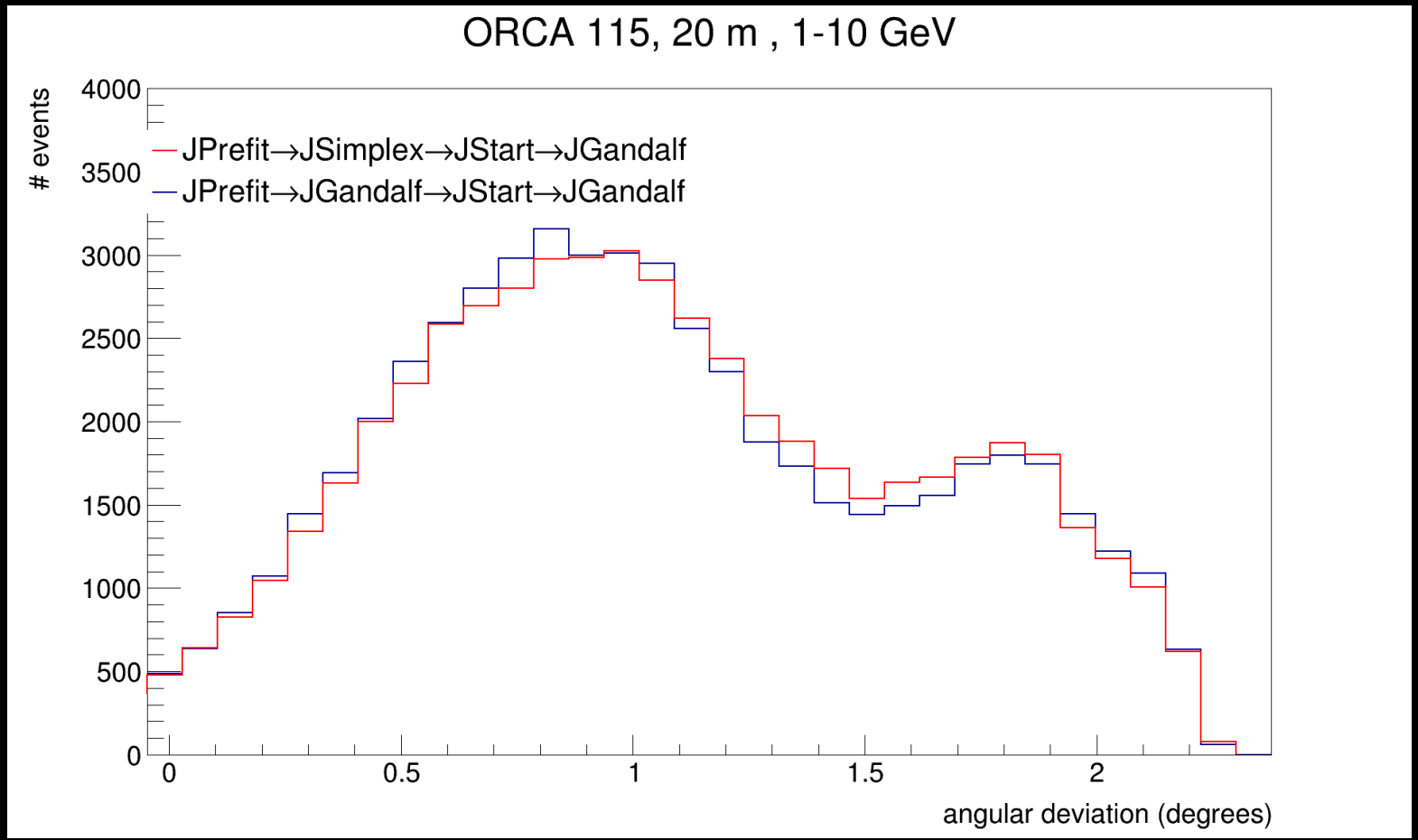
- → No significant difference.
- But “an improvement is still an improvement” - M de Jong 2019

JSimplex or JGandalf

- From Bouke: JSimplex before JGandalf improves speed of JGandalf by ~36 %
- Compared my new JPrefit → JGandalf → JStart → JGandalf to JPrefit → JSimplex → JStart → JGandalf

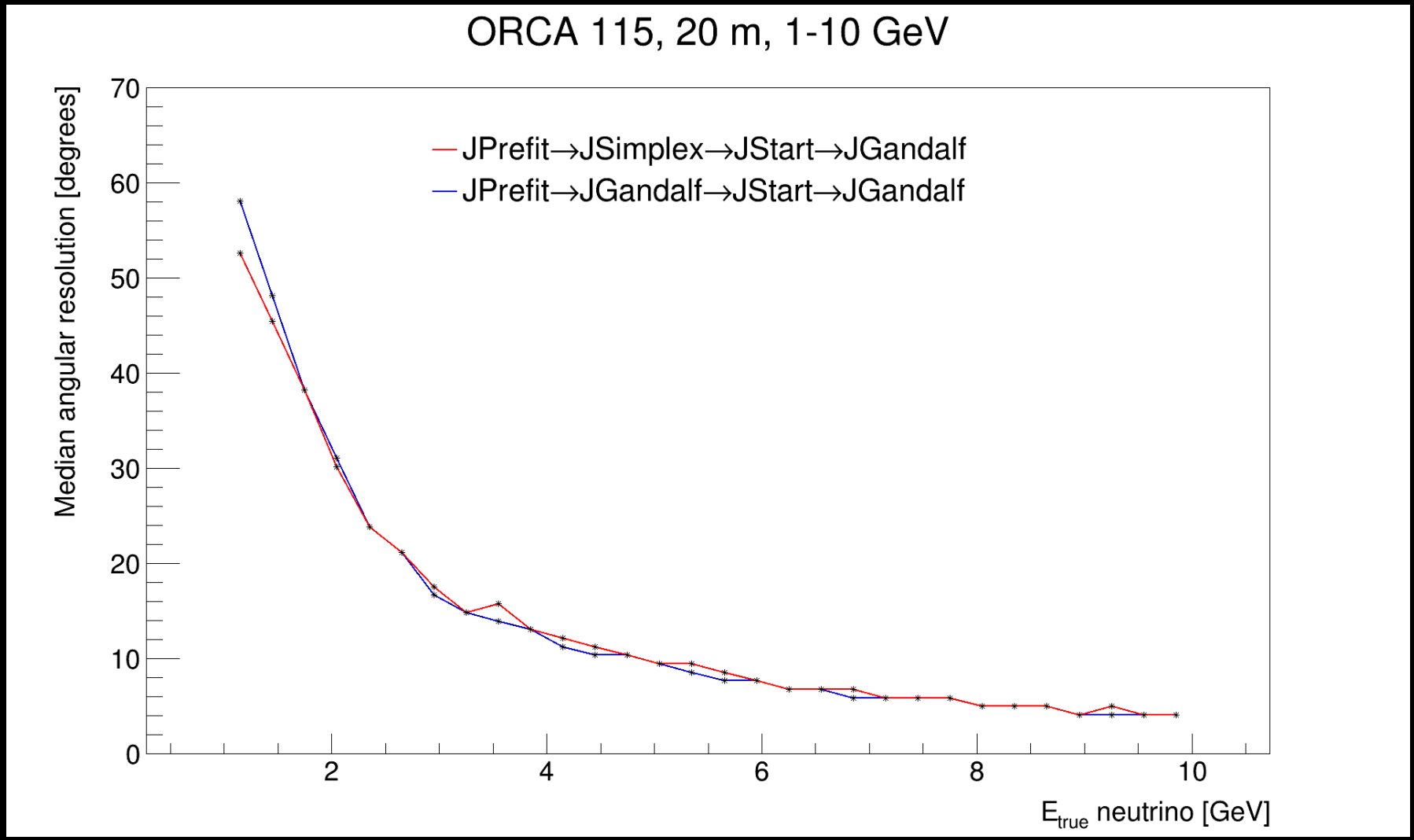
JSimplex or JGandalf

- one loses 16 fitted events in the JSimplex chain. Median difference of ~ 0.5



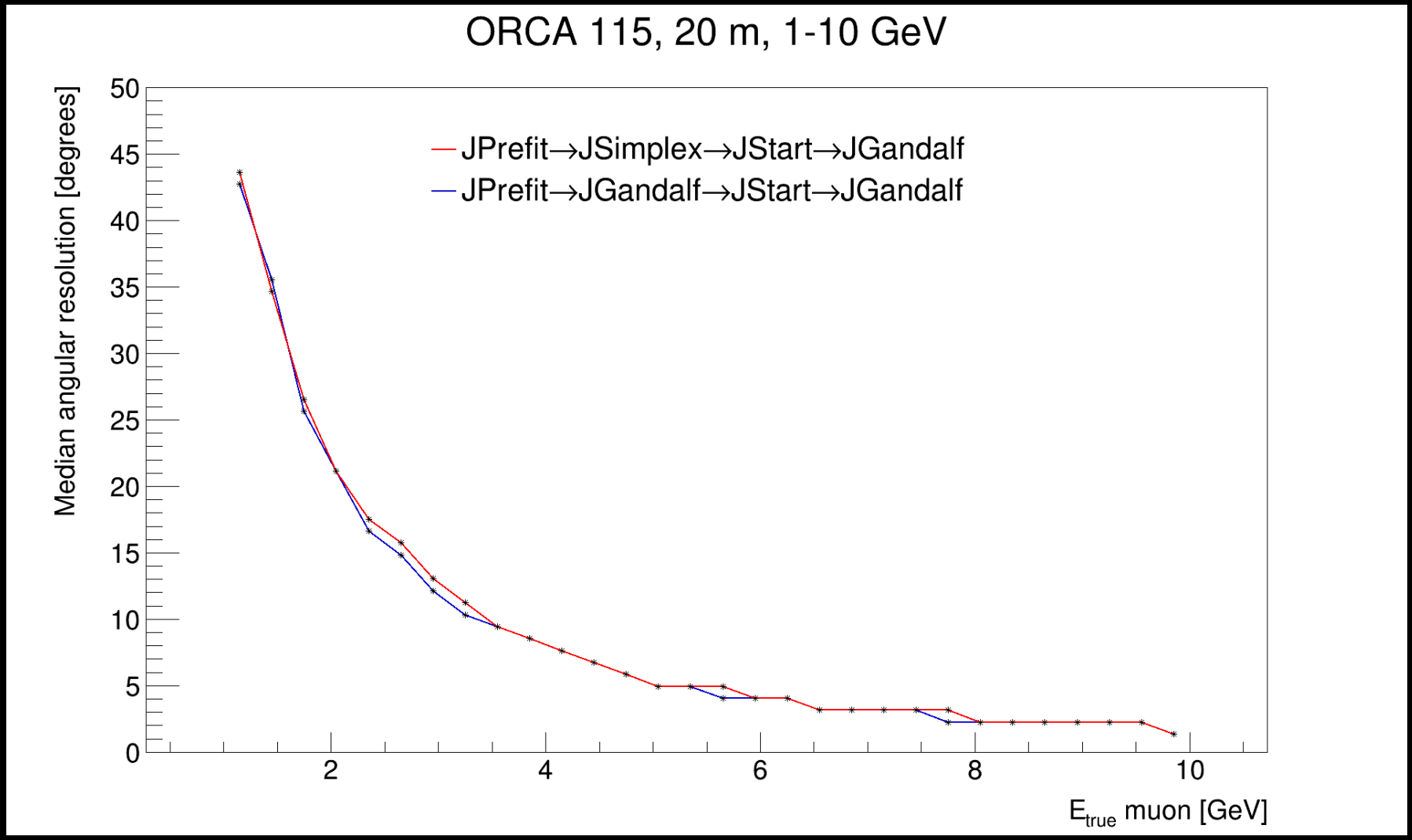
JSimplex or JGandalf

Median angular resolution (neutrino energy)



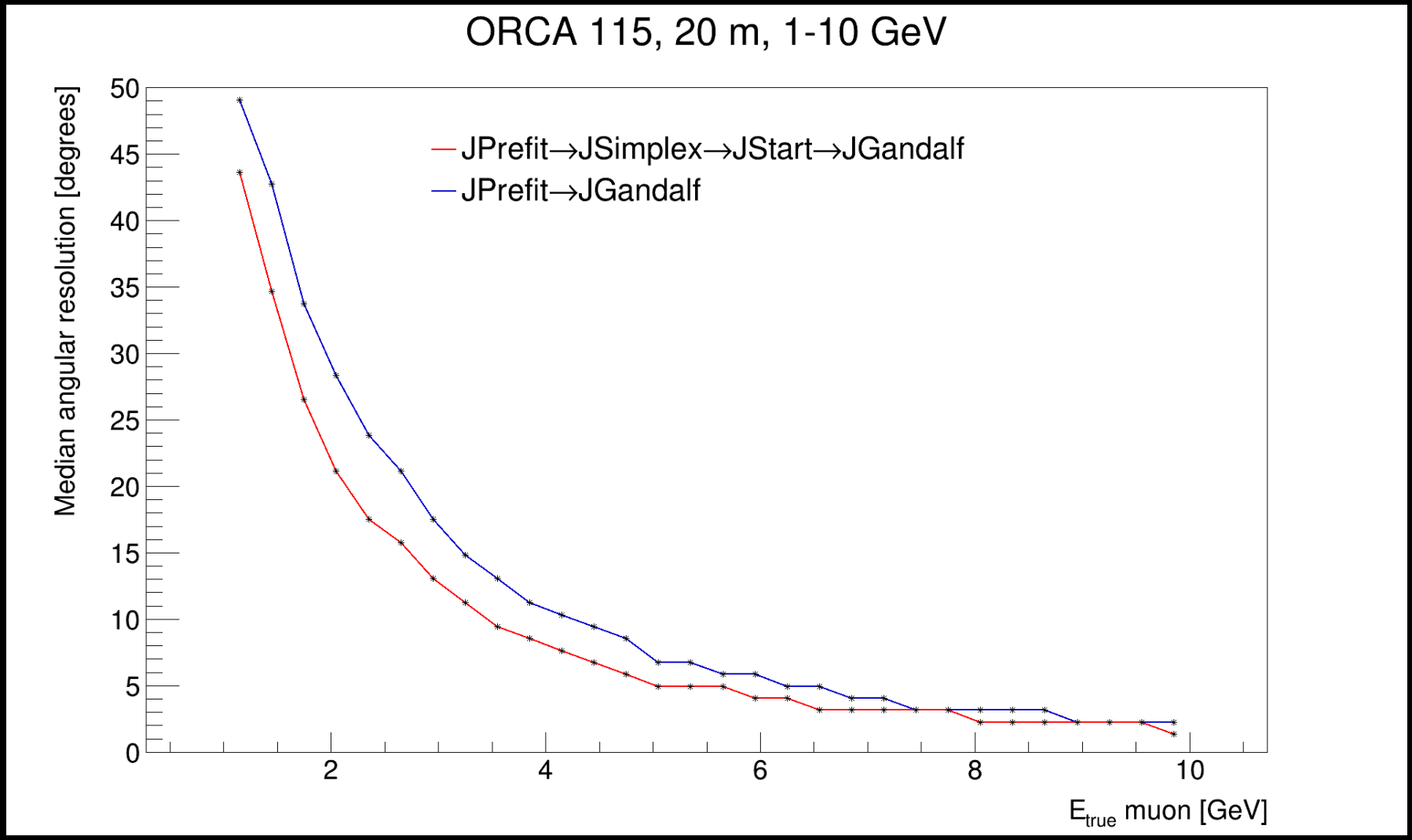
JSimplex or JGandalf

Median angular resolution (muon energy)



JSimplex or JGandalf

Compared to the usual JPrefit → JGandalf ...



JSimplex or JGandalf

- If quicker and practically no difference, perhaps use JSimplex?
- Simplex chain: 492 s = 8.2 mins
  Gandalf chain: 695 s = 11.58 mins