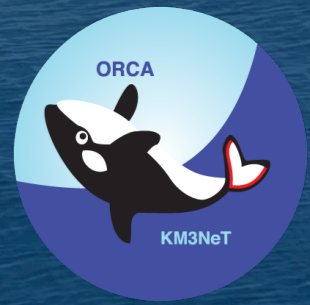
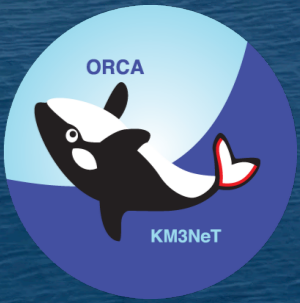


Group Meeting - 03/10/19

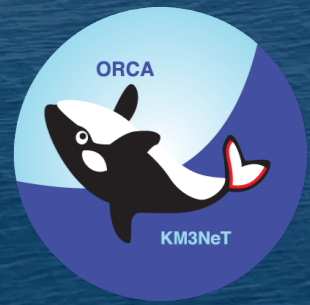


JGandalf Update

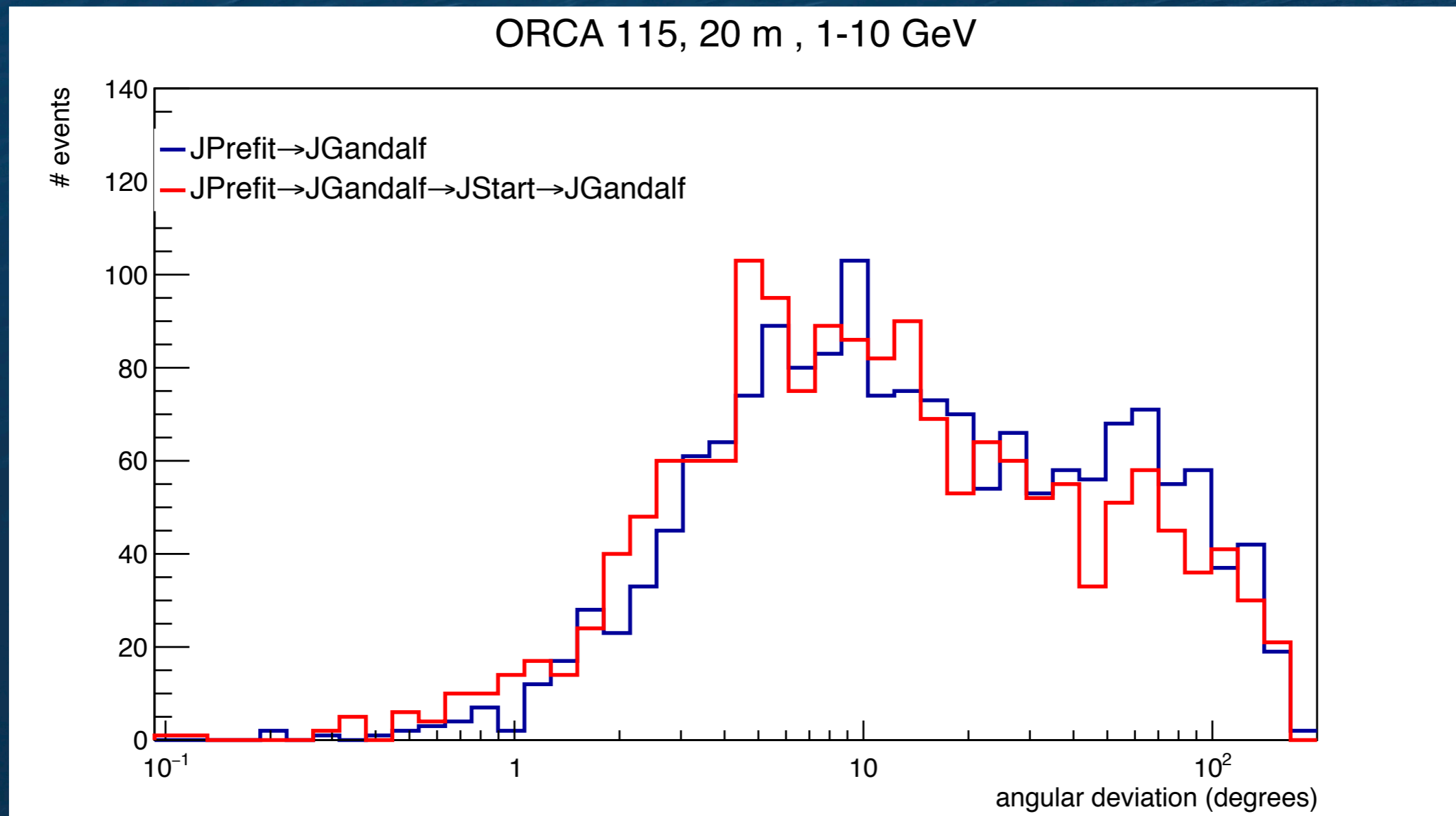


- JPrefit - JGandalf by default uses an 'infinite line' through detector in carrying out direction fit
- As shown previously, running JGandalf after JStart (using the track length for the hit selection) can give an improvement in the angular deviation/median angular resolution
- Expect this to be of significance in low energy regime

JGandalf Update

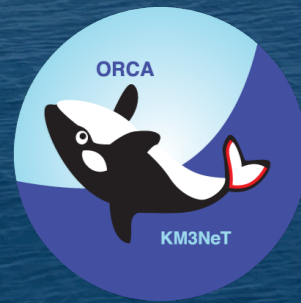


- Angular deviation (from best fit · true muon track)
- Median space angle: 12.992° (no track length) vs. 10.374° (using track length)

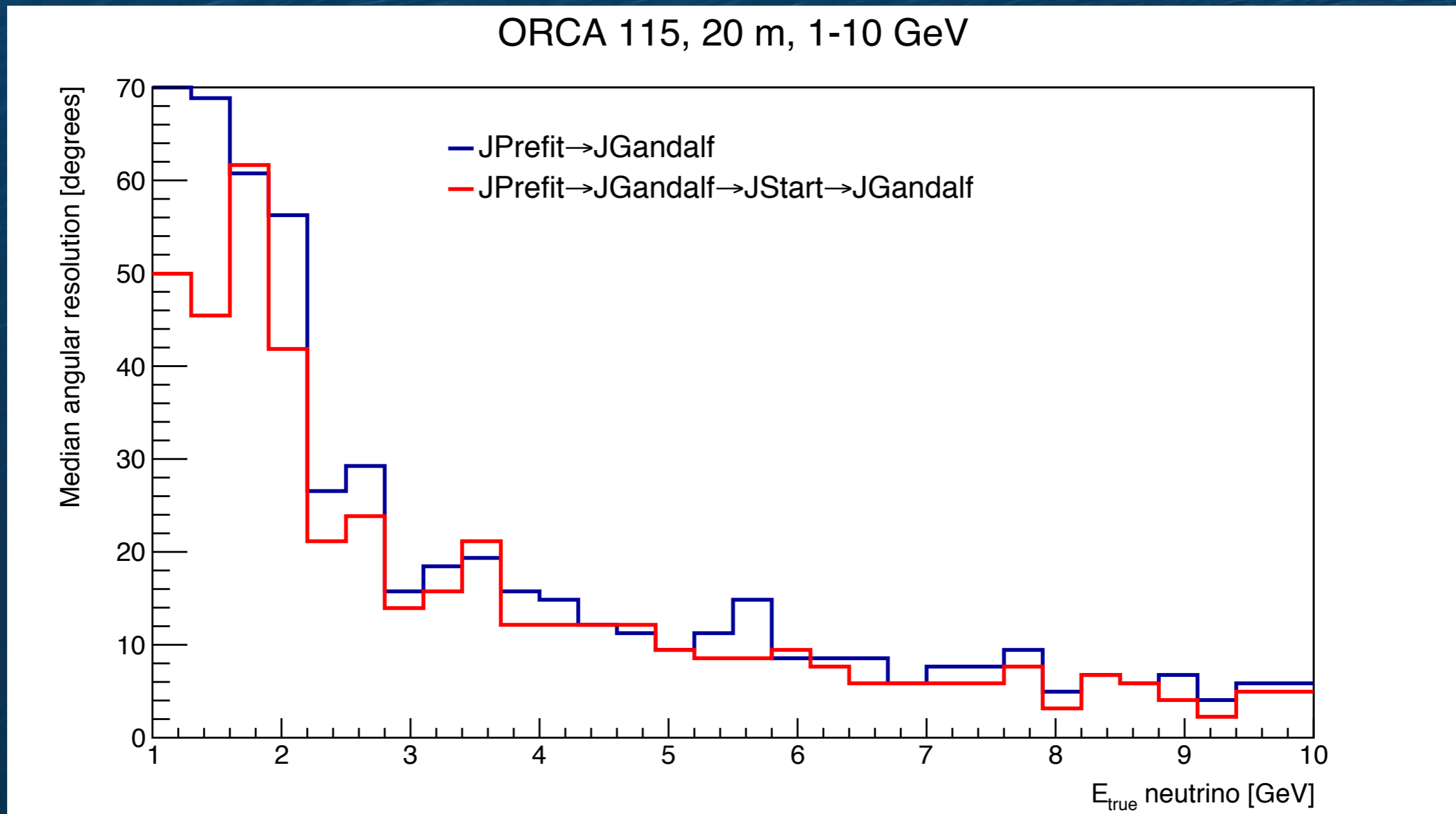


Exact same # of events

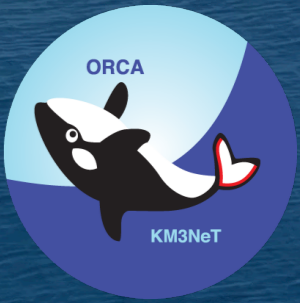
JGandalf Update



- Angular resolution improvement

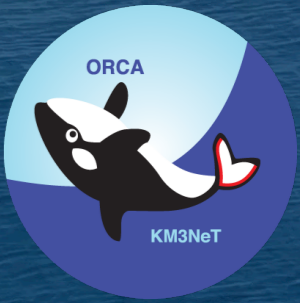


JGandalf Update



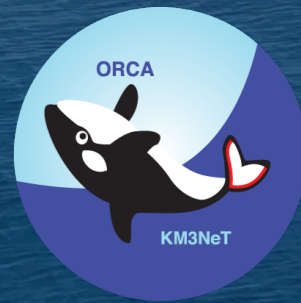
- JGandalf has been updated such that if the object $W(START_LENGTH_METRES)$ exists, it will be used for the hit selection.
- The option *JGandalf -z "x x"* exists to extend the range around the track length by a specified amount. The default is still to take an infinite track when ran after *JPrefit*.

JGandalf Update

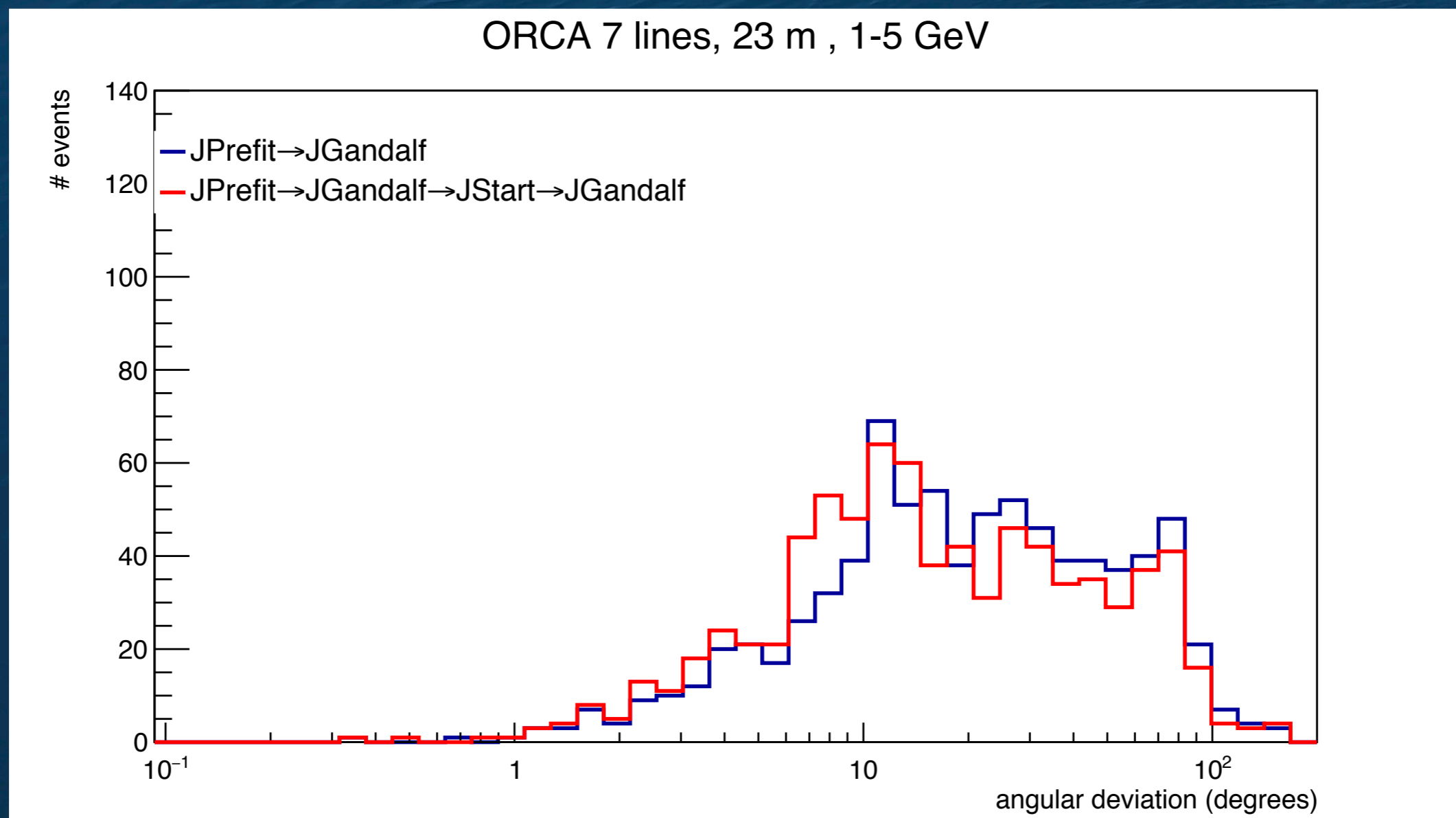


- Checked also for ORCA 7 lines.
- JStart can sometimes fail to reconstruct the track length at low energies, which becomes significant for a small detector configuration.
- For an extension of a few metres downstream, this effect is negated — essentially assigning a track length to the cases when JStart fails

JGandalf Update



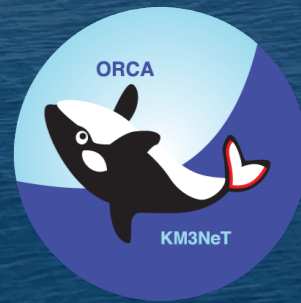
- Median space angle: 19.610° (no track length) vs. 14.650° (using track length)
- 5 degree improvement! Low energy regime.



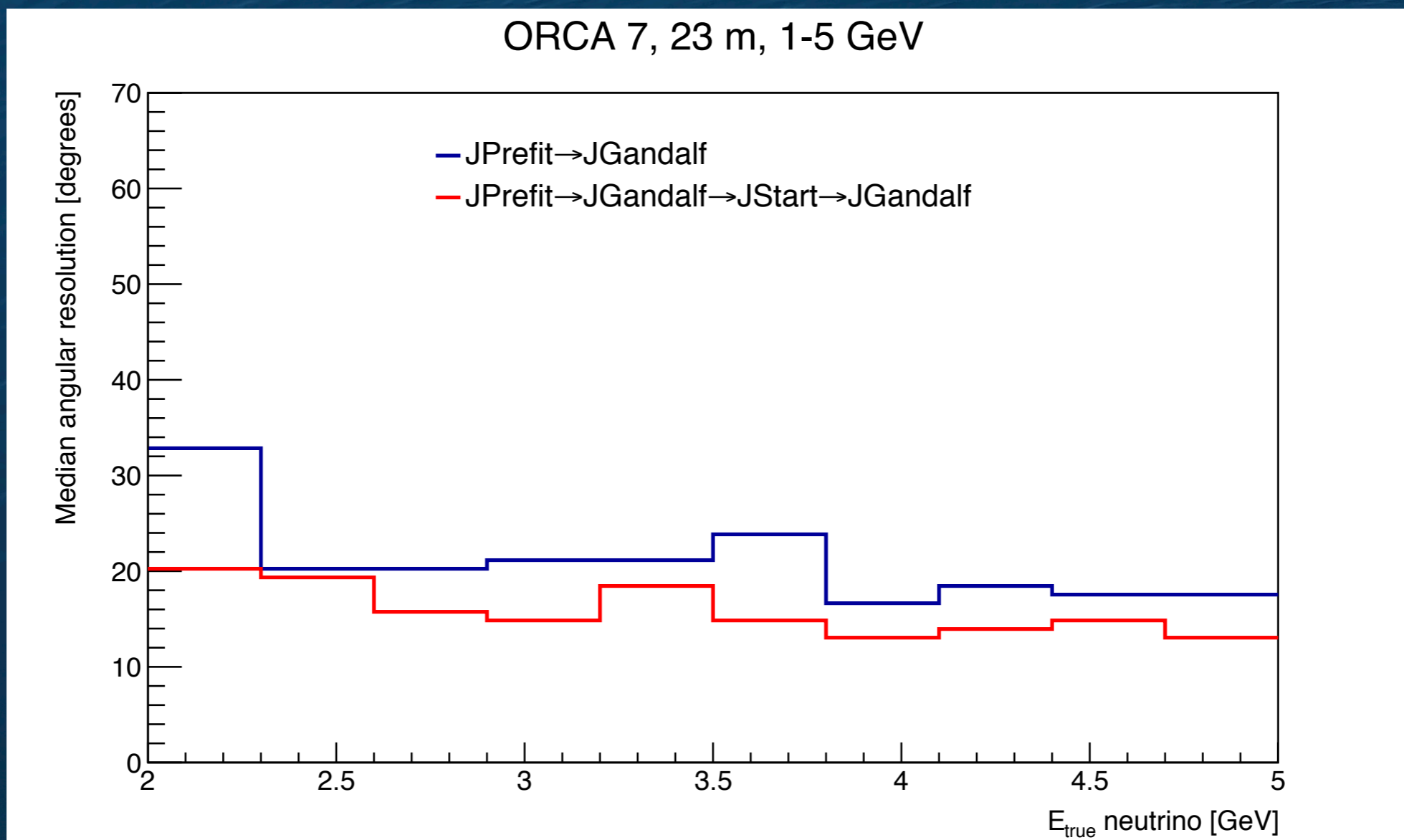
Exact same # of events

Track length + 9 m downstream

JGandalf Update



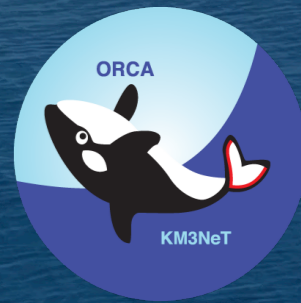
- Median angular resolution
- Low statistics, no cuts, but still a visible improvement



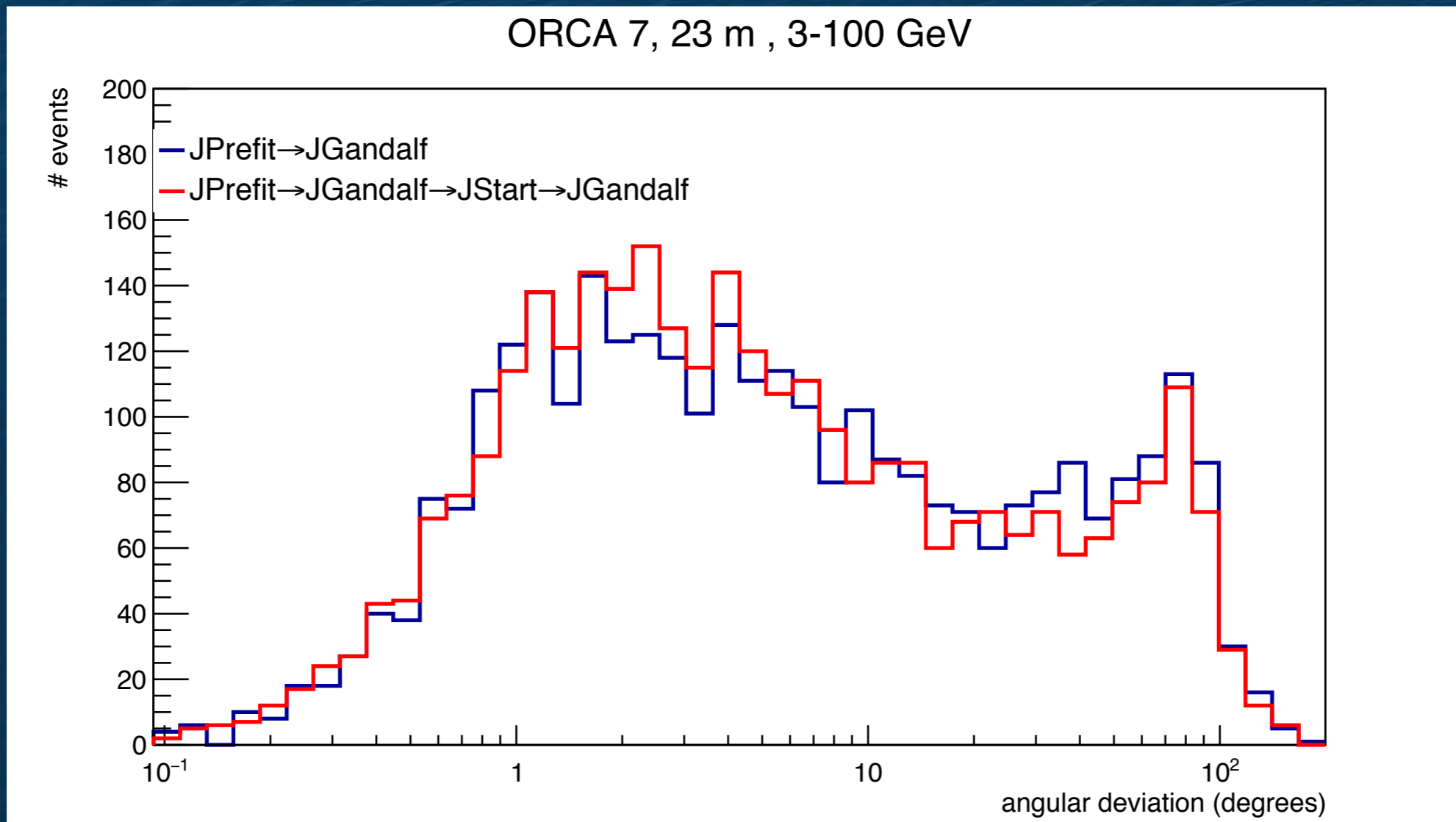
Exact same # of events

Track length + 9 m downstream

JGandalf Update



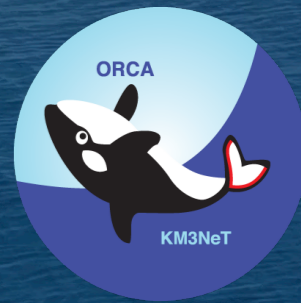
- Smaller improvement for 3 - 100 GeV
- 0.5 degree shift in this case



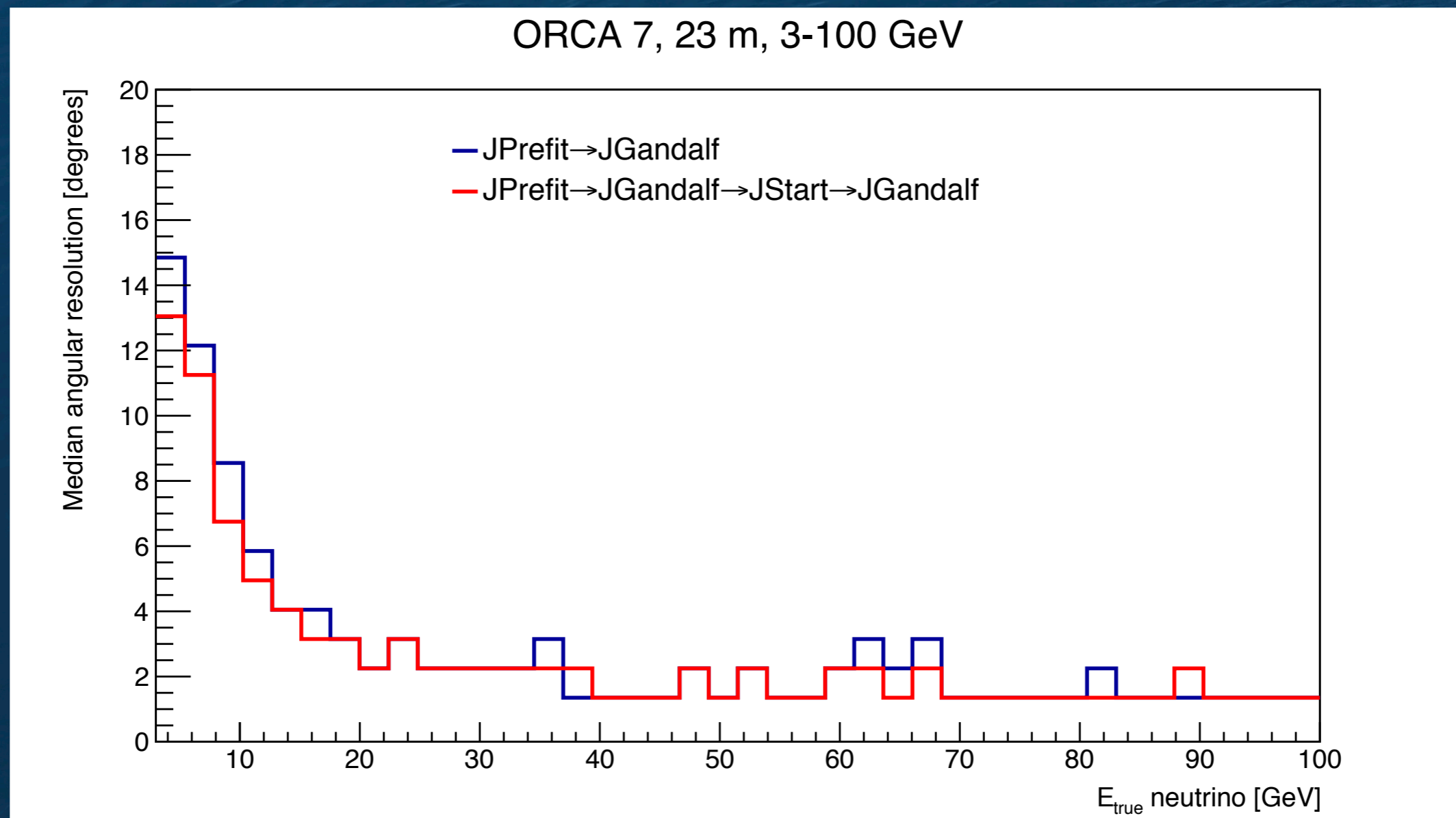
Exact same # of events

Track length + 9 m downstream

JGandalf Update



- Small improvement in median angular resolution visible at lower energies



Exact same # of events

Track length + 9 m downstream