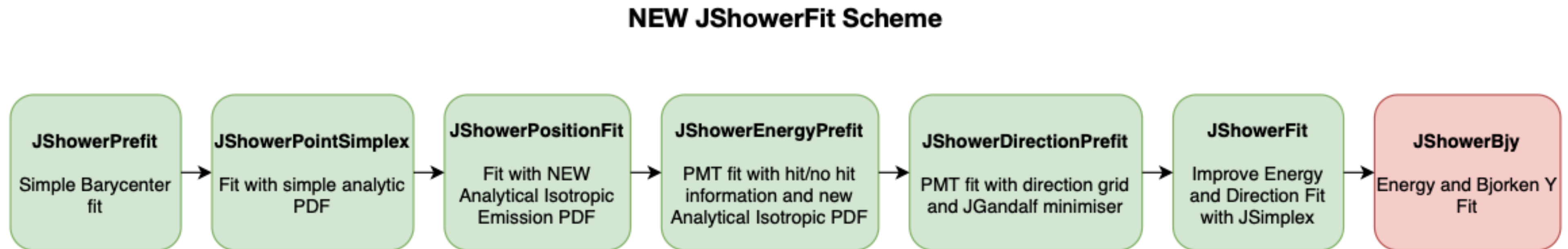


JShowerFit chain

- Like the track reco, the JShowerfit scheme exists as a chain of different applications, with prefits, vertex fits, energy reconstruction.



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JShowerDirectionPrefit

- Good energy estimation to perform good direction reco
- Slow application
- Start from initial direction hypothesis, make a scan in directions, and for each direction loop over all PMTs (inside a sphere from the reconstructed vertex)
- Uses hit/no hit info

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JShowerDirectionPrefit

- Using JSimplex as a minimiser for speed
- A good energy estimation - allows to minimise only 2 direction angle, instead of energy also
- Sphere parameters can be optimised..

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JShowerfit

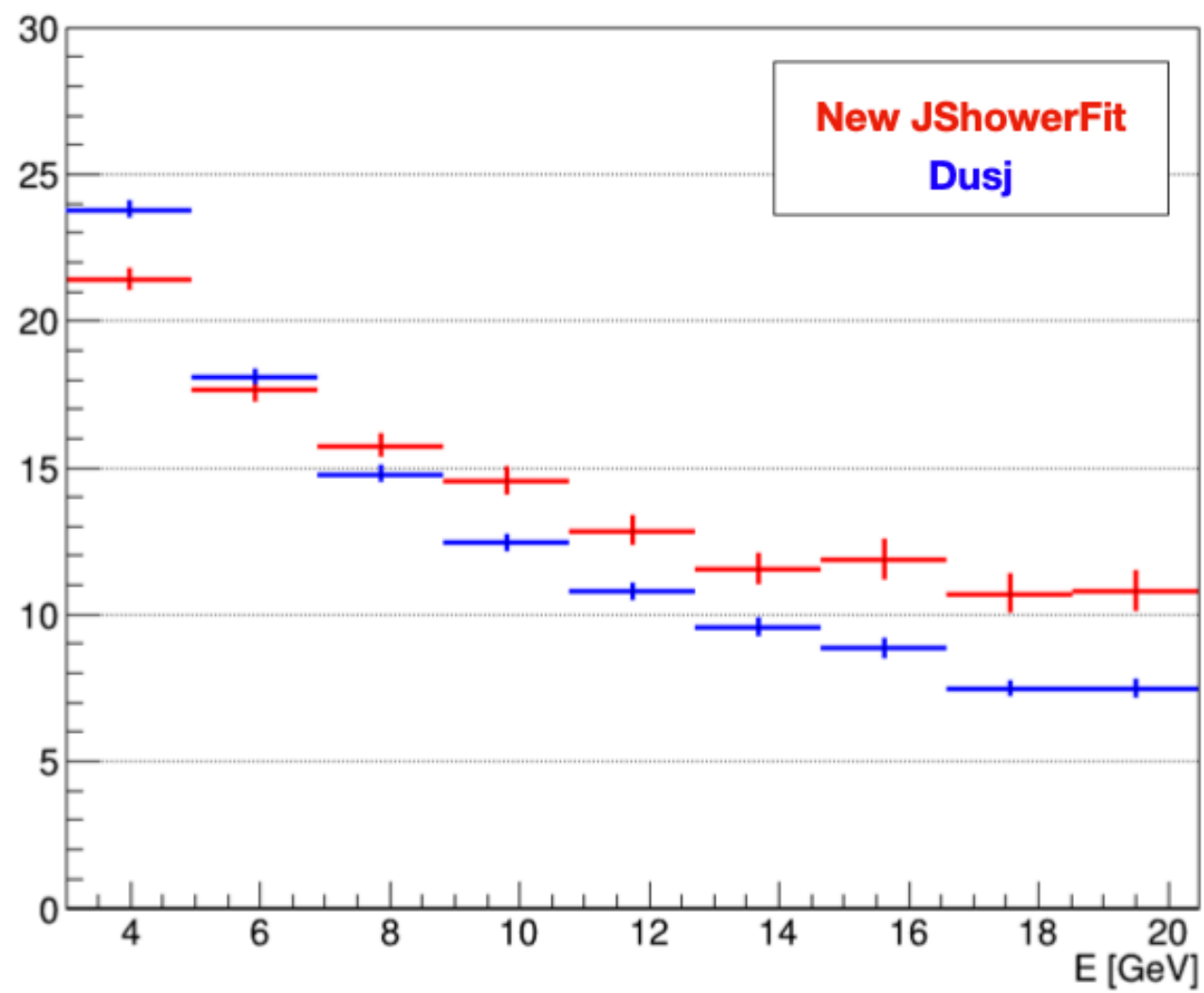
- For each event, take best 4 fits from previous application
- For each prefit, take the previously reconstructed direction and energy as a starting point.
- JSimplex minimisation
- Reconstructs energy and direction

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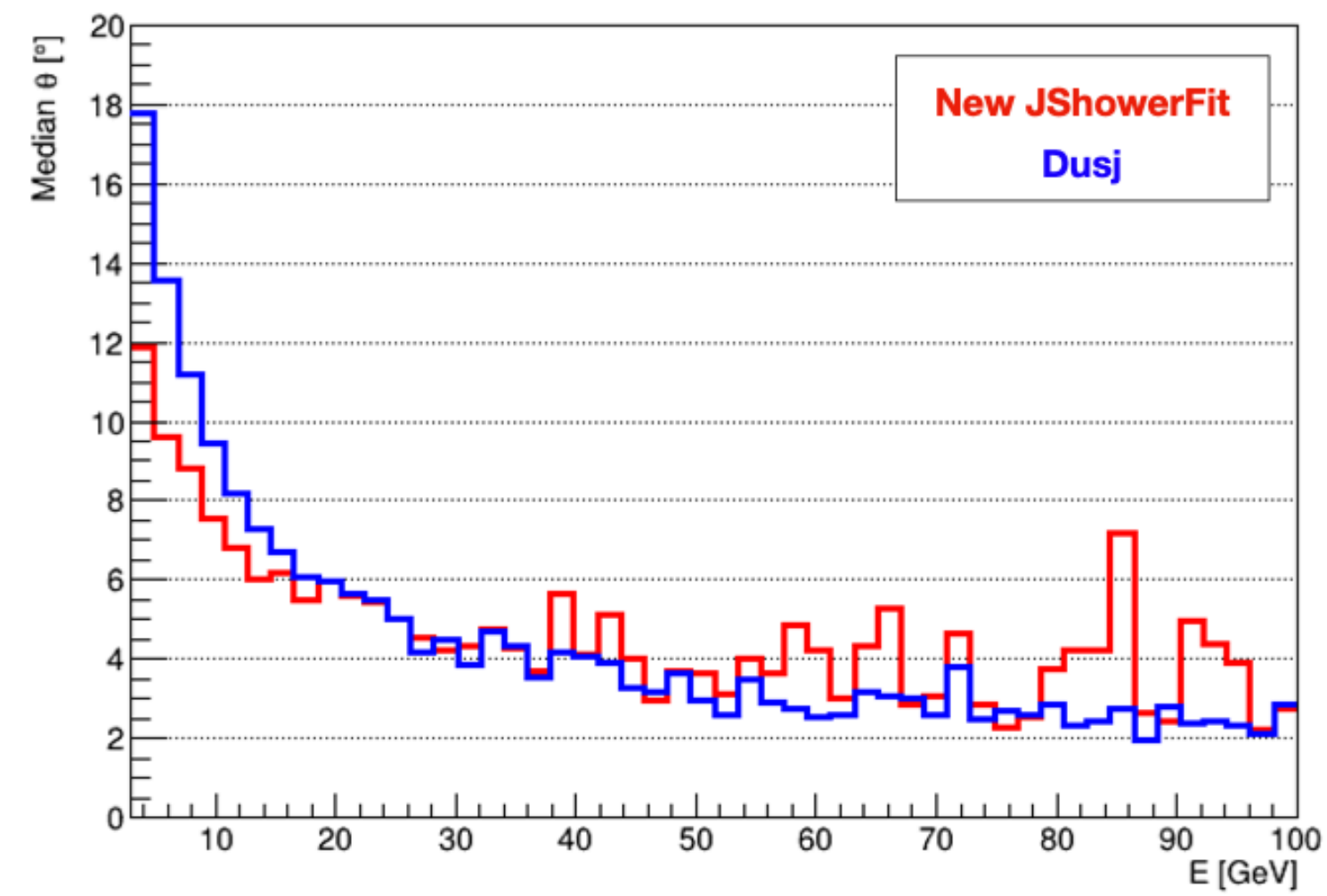
https://indico.cern.ch/event/893586/contributions/3880872/attachments/2050527/3436902/CollaborationMeeting_Online_Domi_PDF.pdf

JShowerfit

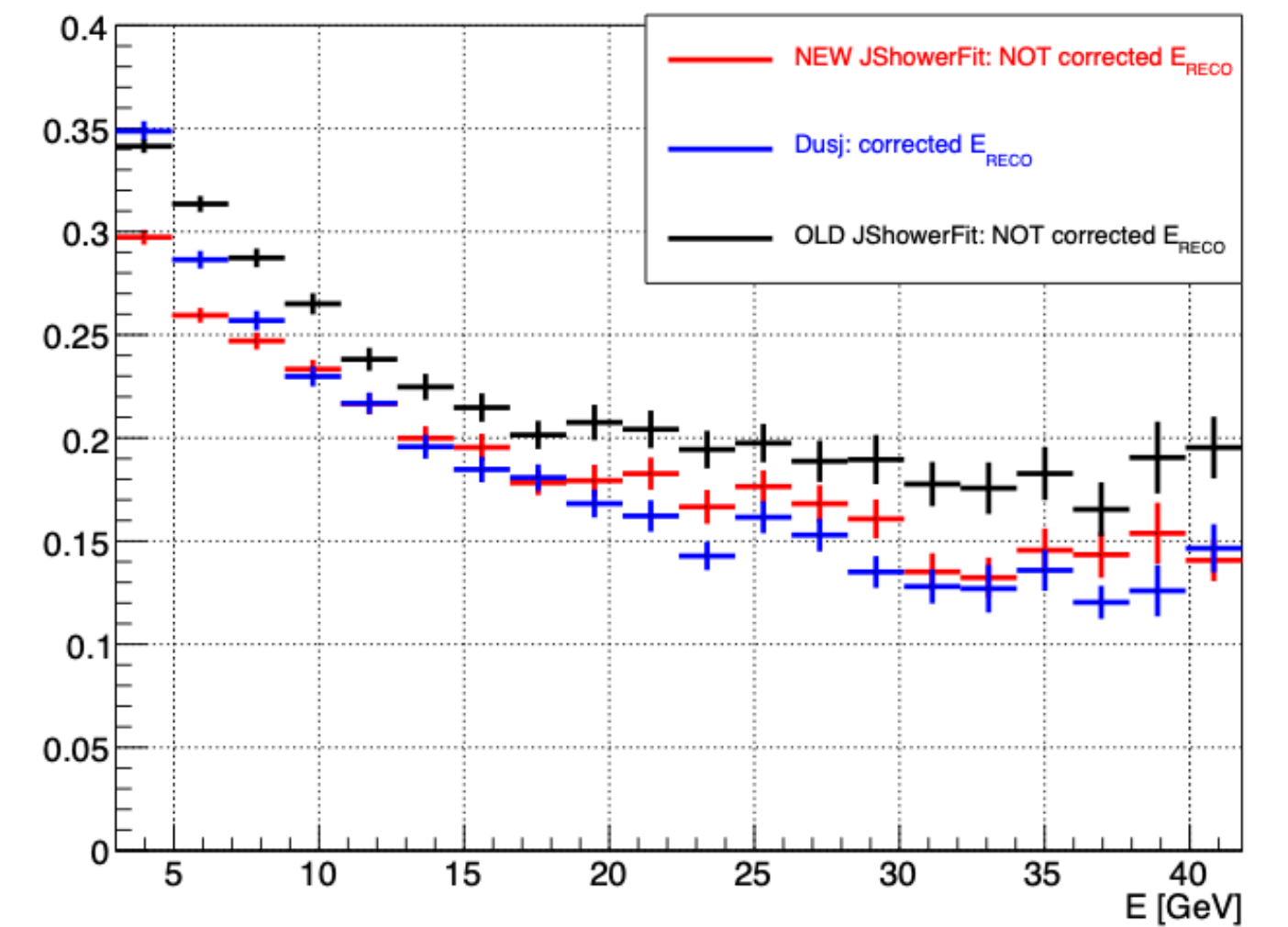
Mean Neutrino Direction Resolution for run 1-10 of FULL ORCA



Median neutrino direction resolution for run 1-10



Fractional Energy Error of all events for run 1-10



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Comments

- Modular, in a sense. Can play with the chain ordering, even combine with muon track reconstruction applications .. e.g. <https://elog.km3net.de/Computing+and+Software/439>
- Which PDFs are used where?

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- Modular, in a sense. Can play with the chain ordering, even combine with muon track reconstruction applications .. e.g. <https://elog.km3net.de/Computing+and+Software/439>
- Which PDFs are used where?
JShowerBrightPointRegressor is used to reconstruct the shower vertex (brightest point), so it should reconstruct a 4D point (x,y,z,t) — uses a PDF with the time information
- JShower3EZRegressor is used for energy and direction reconstruction: in this case you do NOT need the time information, that's why a time integrated PDF is used. The hit/no hit info is then needed