Z_{vtx}<10 cm EMCal Simulations

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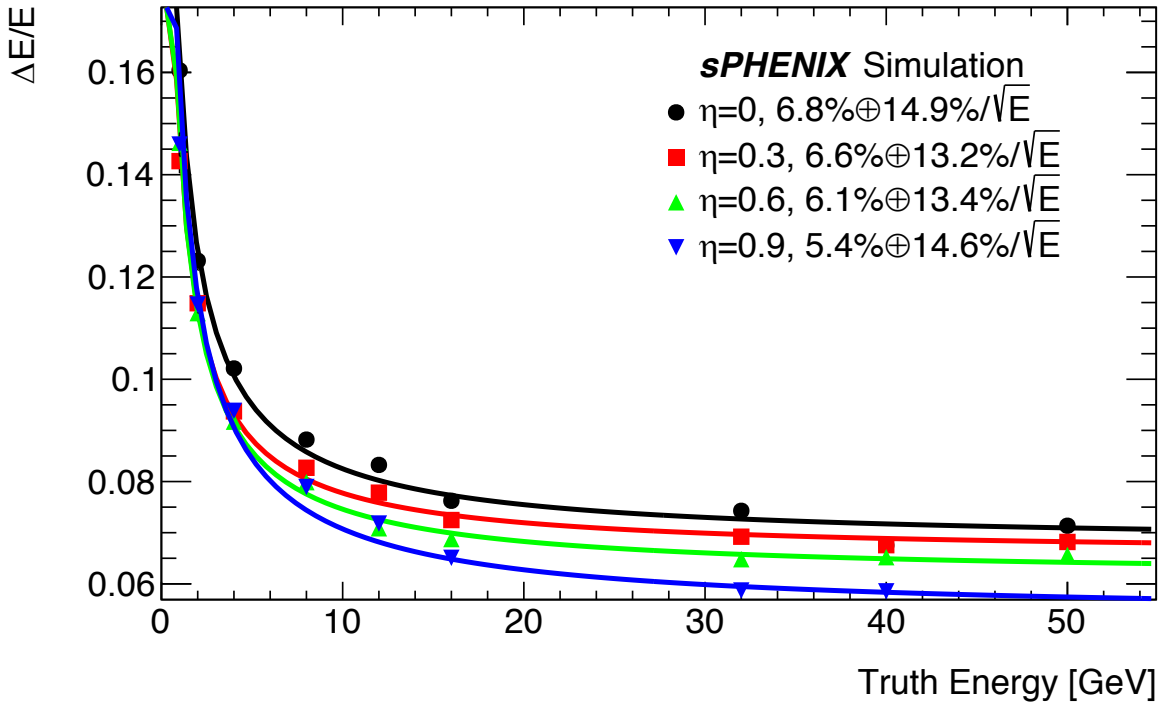
Overview

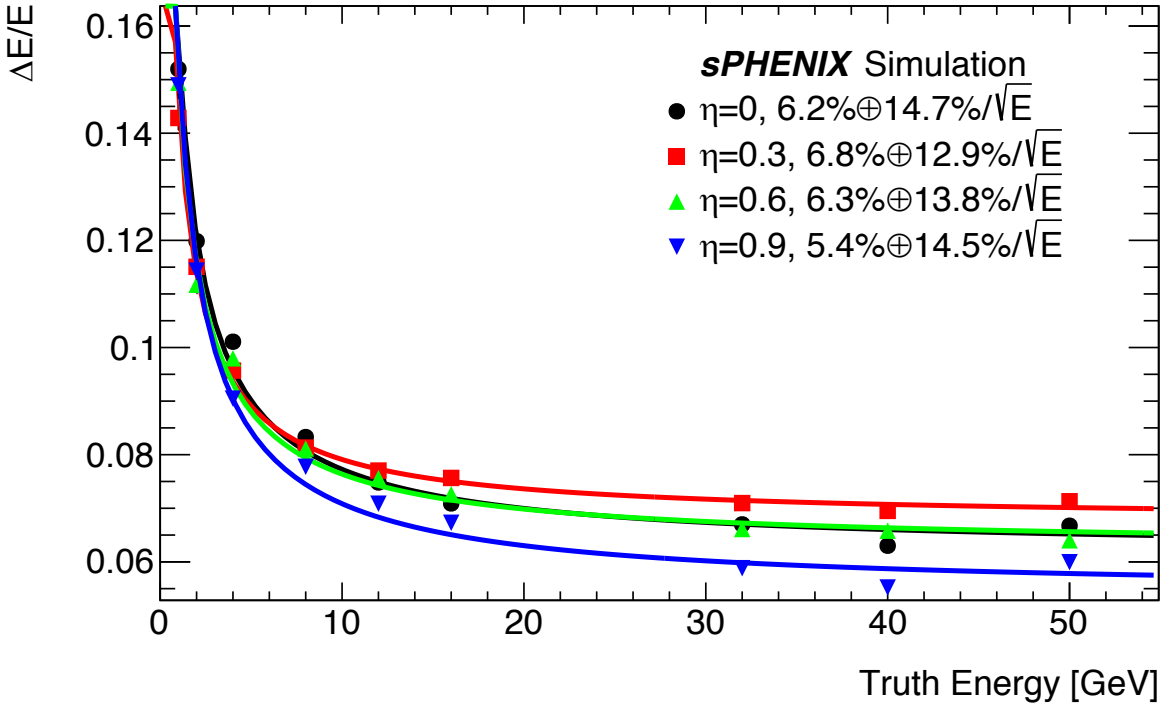
- Look at single particle simulations with z_{vtx} ±10cm
- Can compare to previous simulations with z_{vtx}=0
- Can also test any correlations that position dependent recalibration has
  - If no correlations, should work on the z_{vtx} ±10cm data since this is a completely independent set of simulations

Comparison with z_{vtx}=0 cm (No position dependent correction)

Photons, z_{vtx} ±10 cm



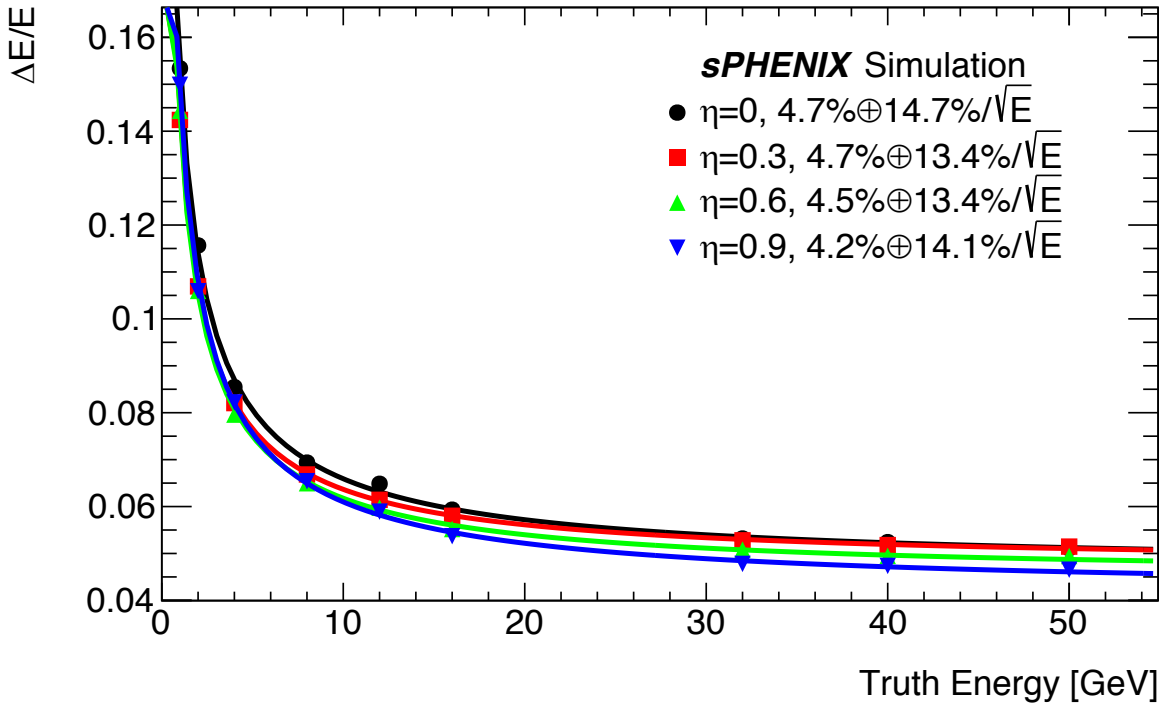
Photons, z_{vtx} 0 cm



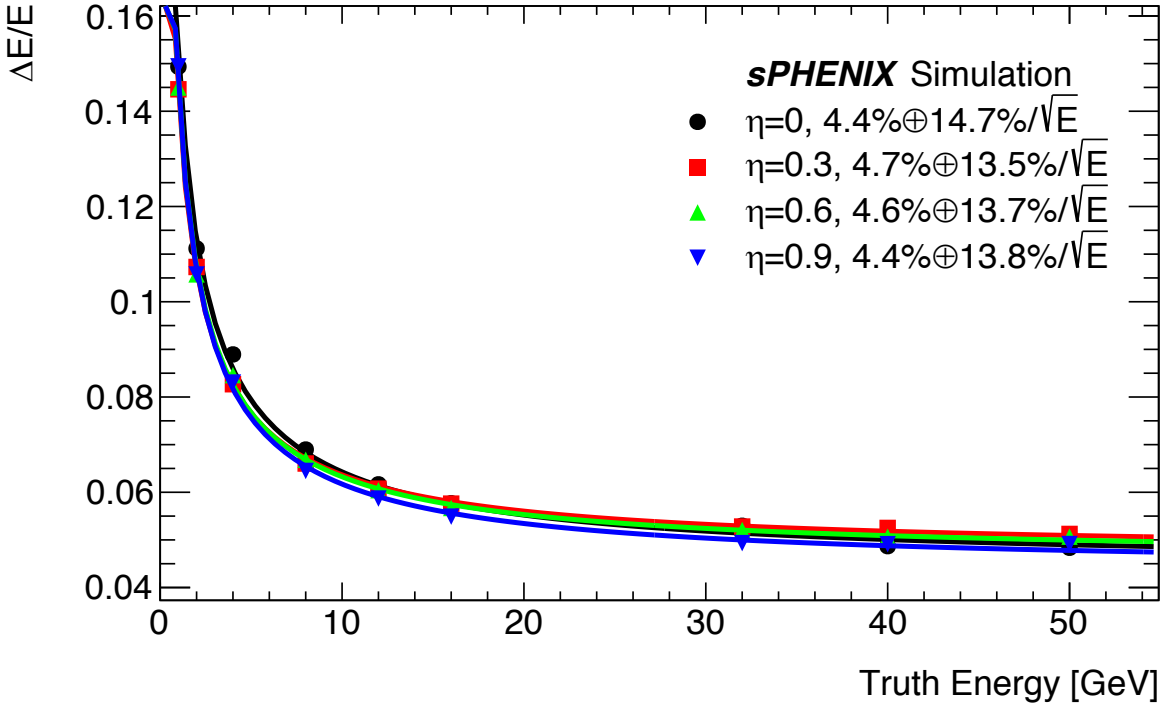
No real difference in resolution fits

Comparison with z_{vtx}=0 cm (With position dependent correction)

Photons, z_{vtx} ±10 cm



Photons, z_{vtx} 0 cm



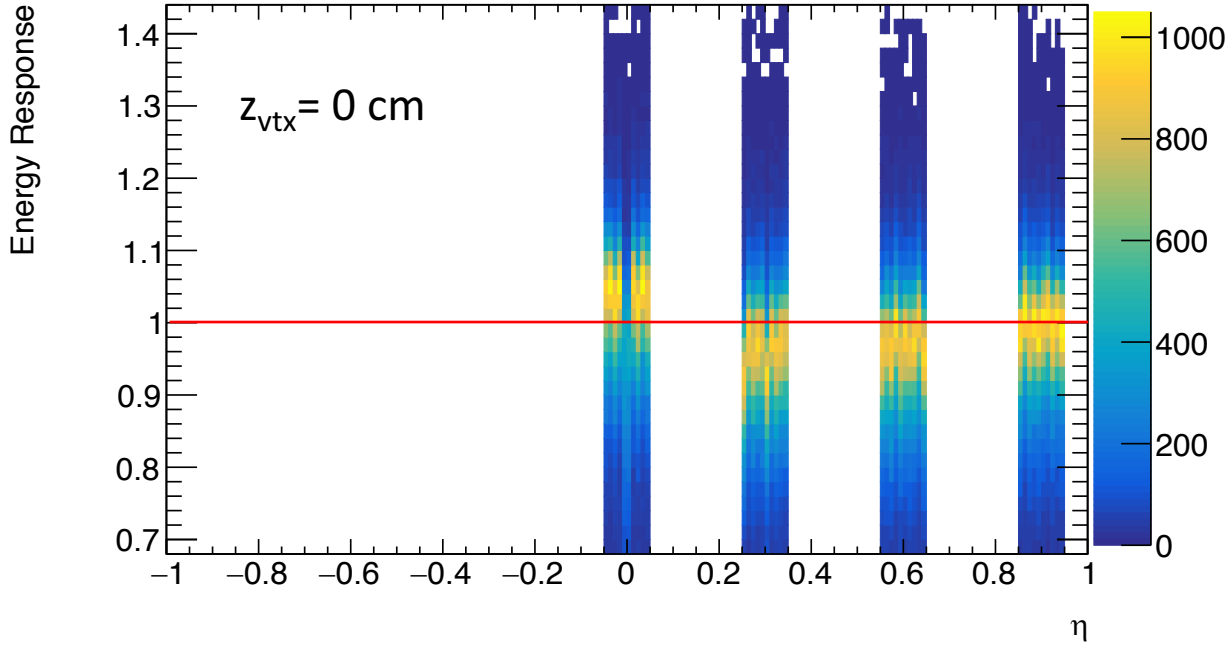
No real difference in resolution fits

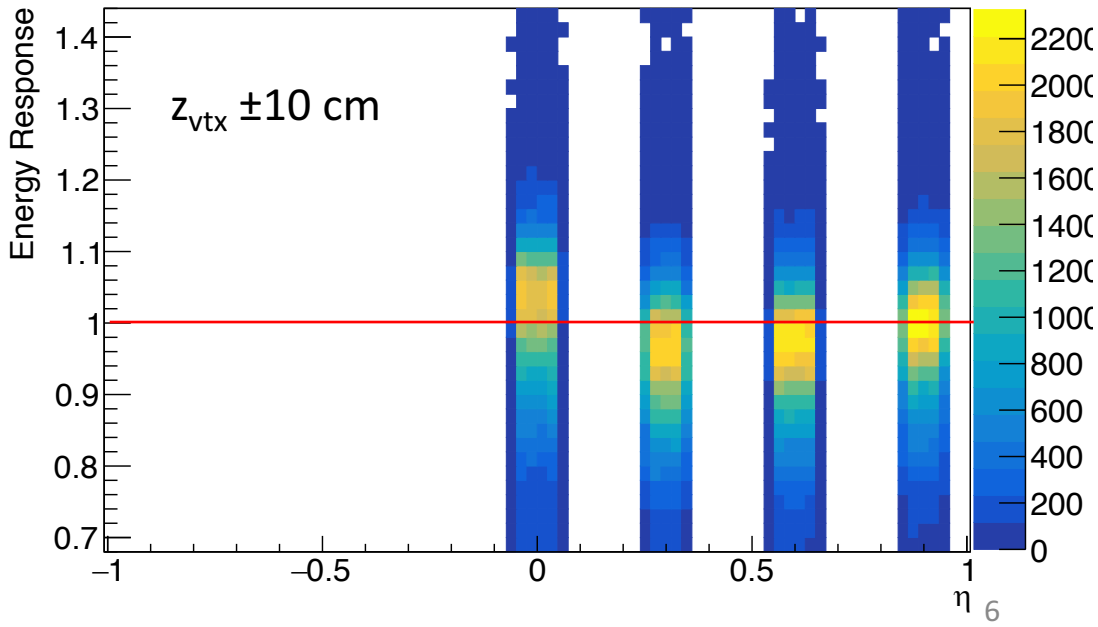
Pause For Conclusions

- The position dependent correction works well on the z_{vtx} ±10 cm simulations
- Therefore the correction does not suffer from self-correlations since these are completely independent "data" sets
- z_{vtx} ±10 cm simulations show nearly similar behavior to z_{vtx}=0 cm when looking at the resolutions

Energy Response

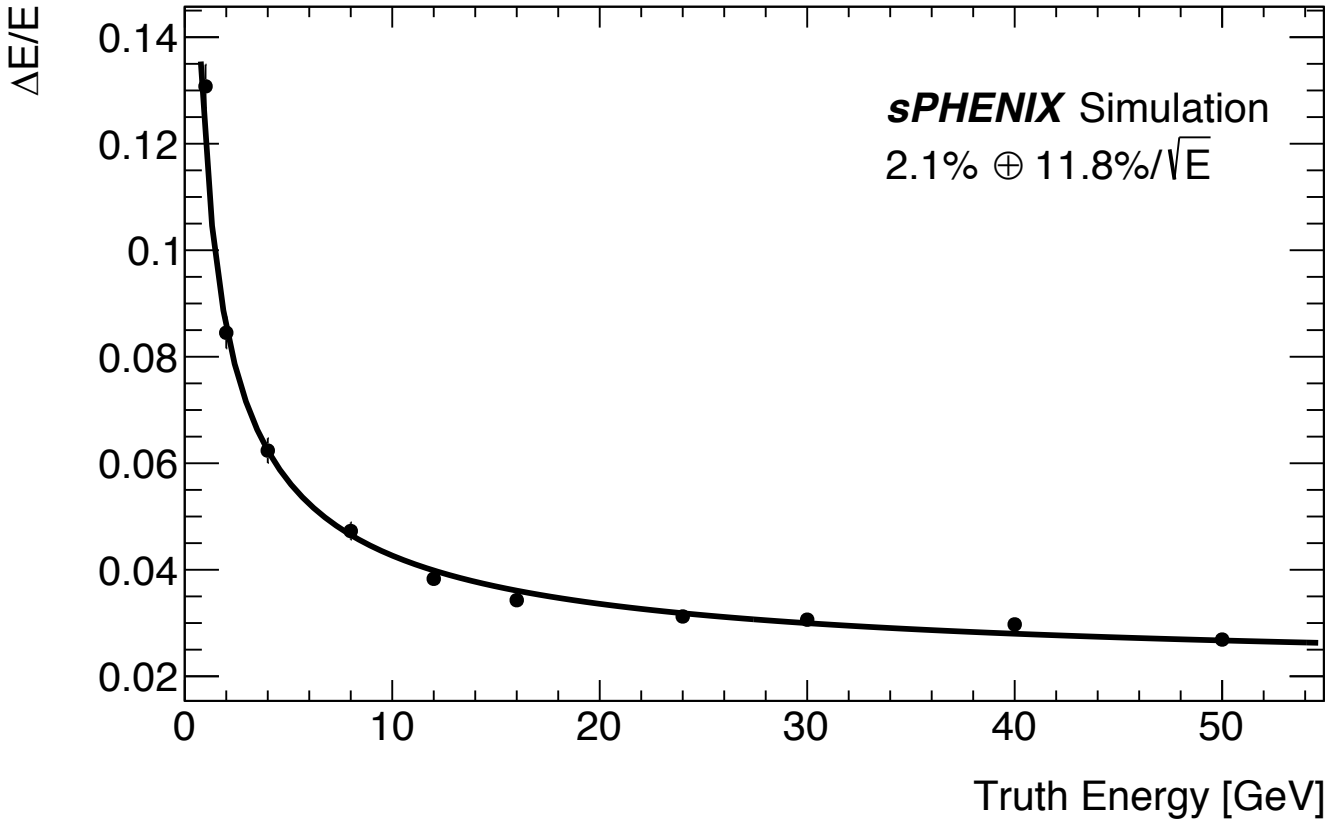
- Saw from Dennis last week that new SPACAL has energy response difference at $|\eta|<0.15$ than elsewhere due to 1D vs. 2D projectivity
- z_{vtx} ±10 cm data shows similar behavior. Will need to do a tower-by-tower calibration
- One thing to note is that response at exactly $\eta=0$ is better as expected when z_{vtx} is smeared out



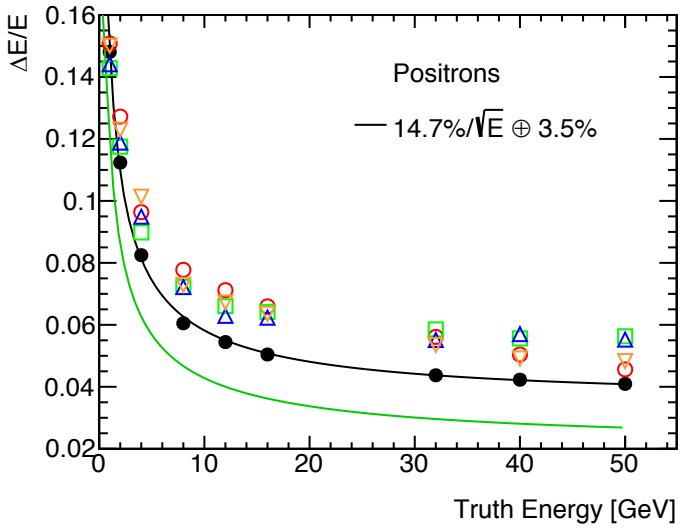


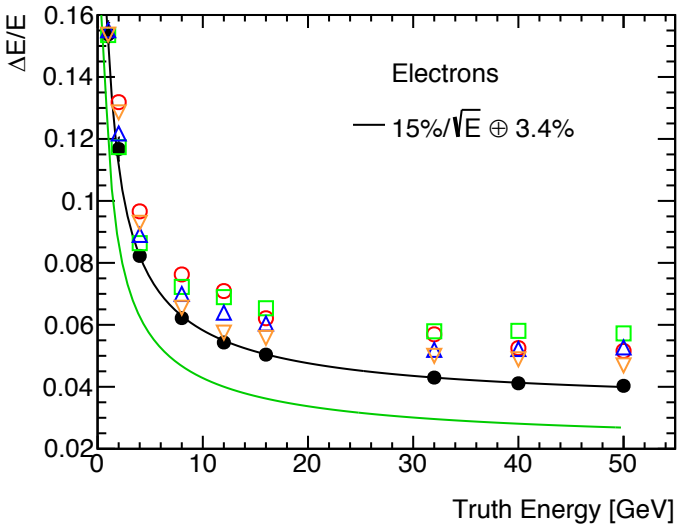
Perfect Single Tower Simulation

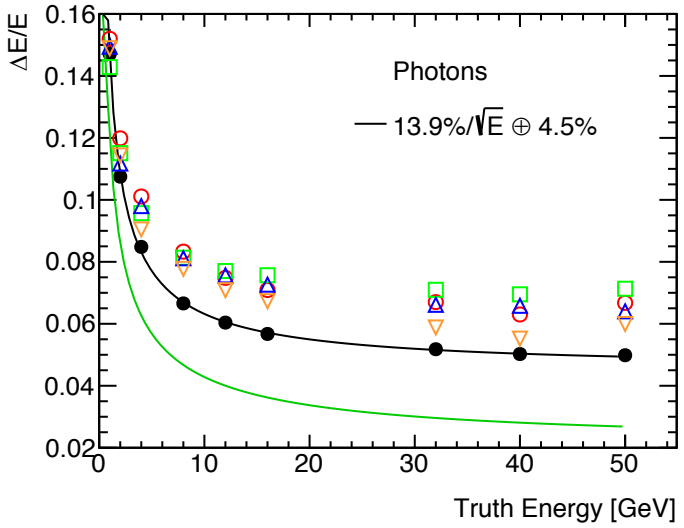
- Simulate photons with beam pipe and EMCal only, fire photons at center of one 2D SPACAL tower with 100% light efficiency
- Same as last week but with 100% light efficiency
- Reduces constant term to 2%

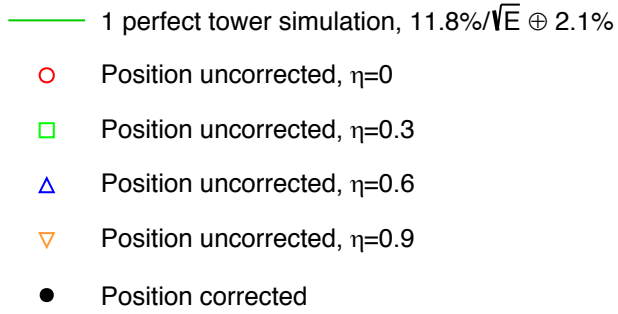


New EMCal Resolution Comparisons









Conclusions

- Single particle EMCal simulations look stable across z_{vtx}
- Position dependent correction works well for independent data set
- Tower-by-tower calibration is necessary to account for 1D vs. 2D projectivity in $|\eta|<0.15$ and $|\eta|>0.15$
- Perfect EMCal simulation with 100% light efficiency pushes constant term down to 2%