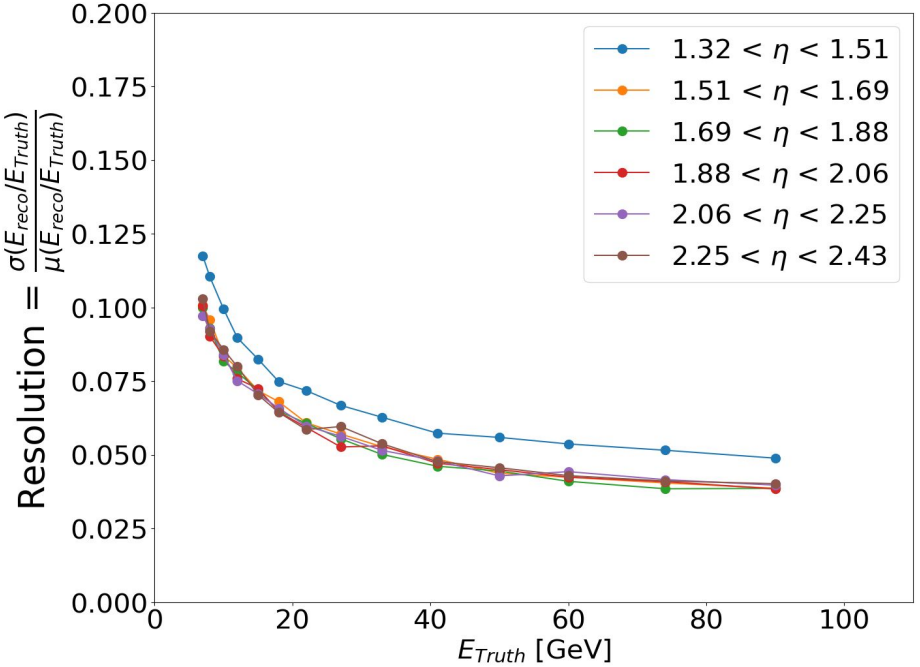
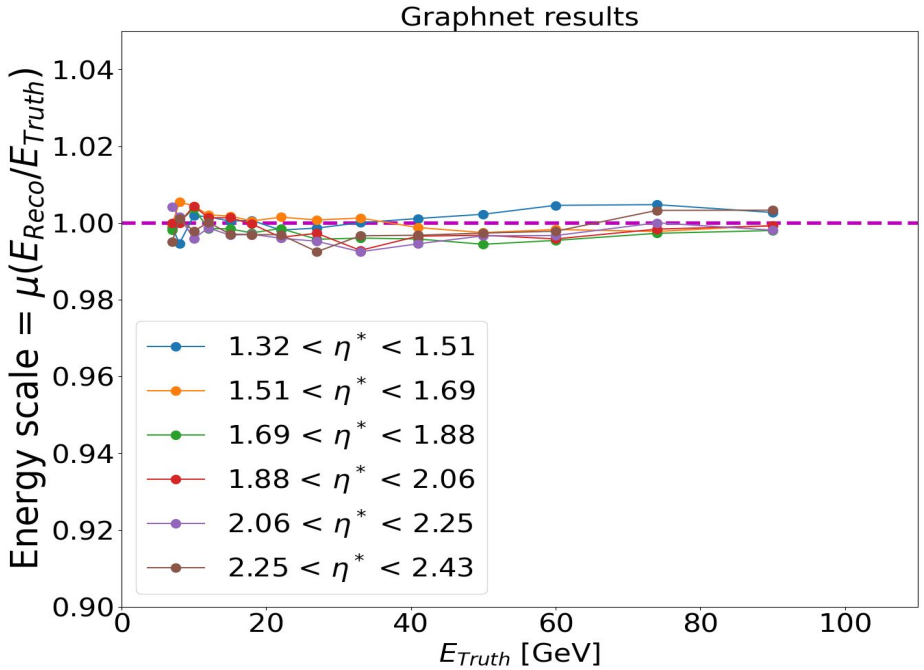
Update on W vs no W

Resolution in pseudorapidity bins

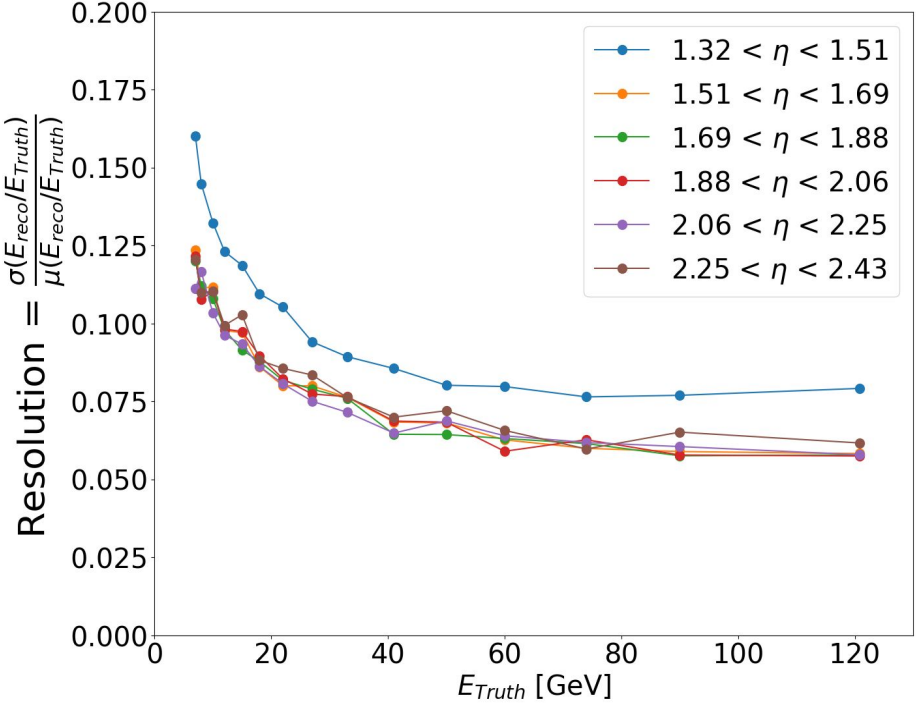
HCAL (0W) Performance at different η
With ECAL

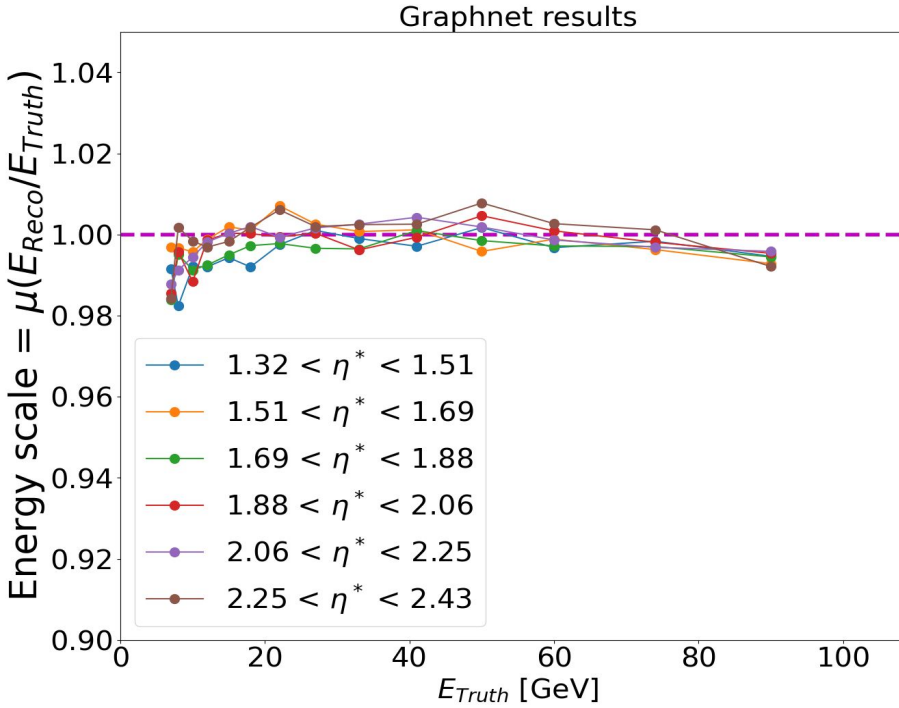




- Single pion was generated between 10 - 30 deg
- At lower **η** (at edges) we have relatively poor resolution

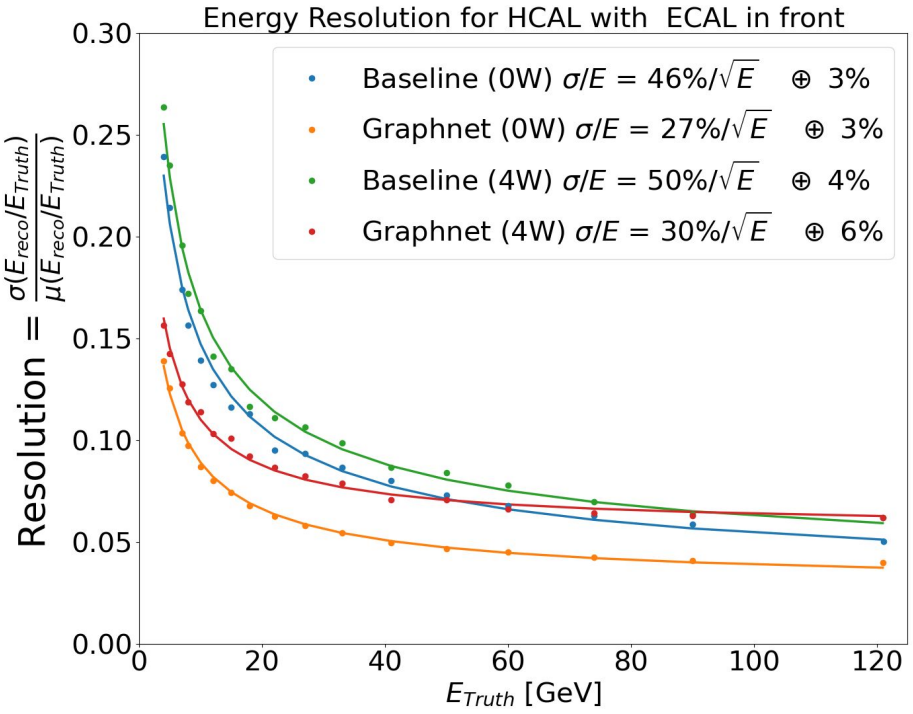
HCAL (4W) Performance at different η
With ECAL

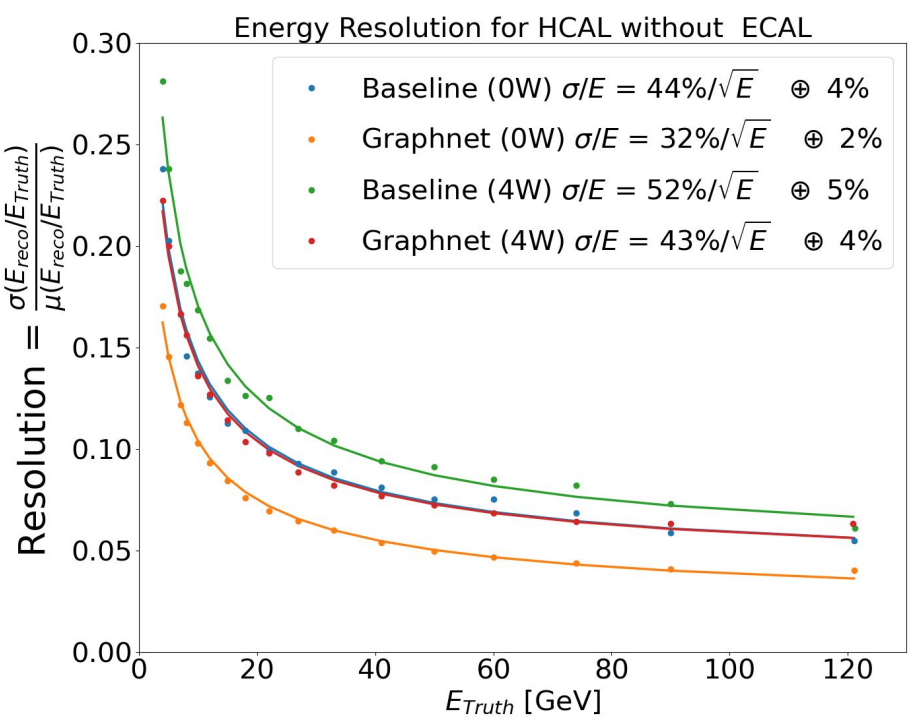




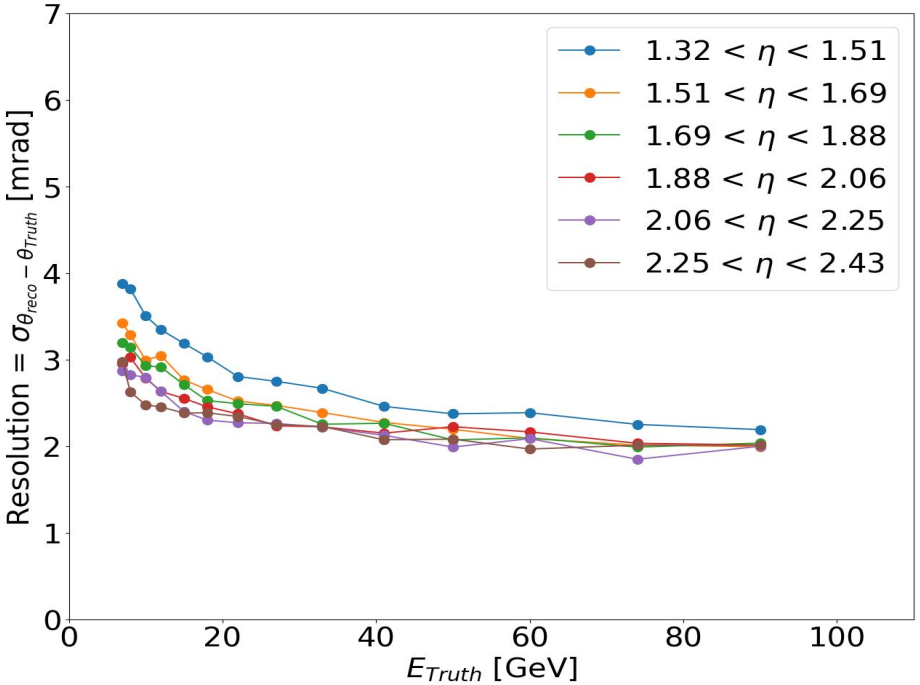
We can see some edge effect but over broad range of η resolution remains contant

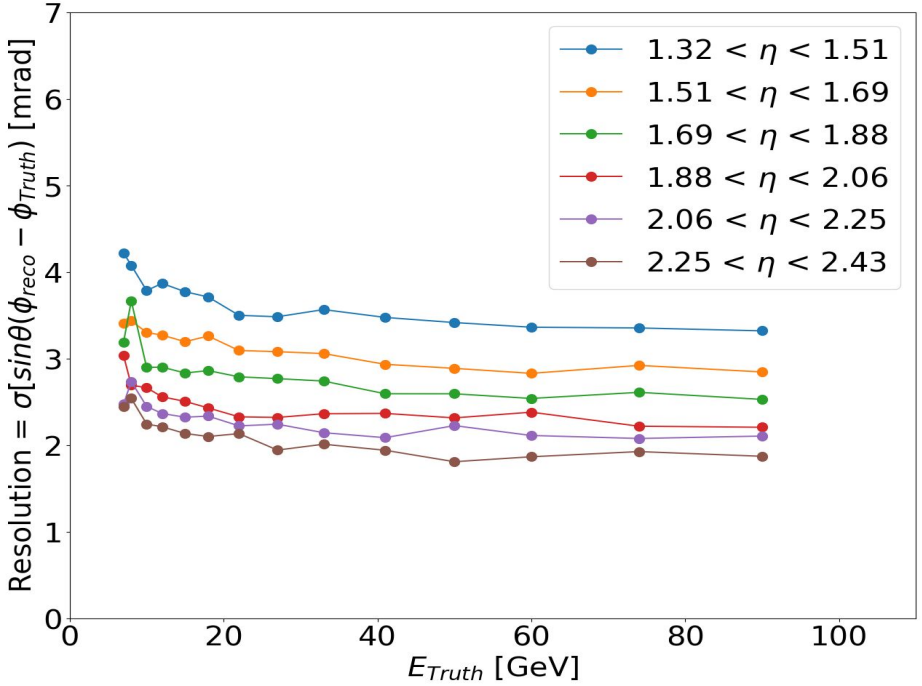
Energy resolution with and without ECAL in front of HCAL





HCAL (0W) Angular resolution using Graphnet at different η
With ECAL

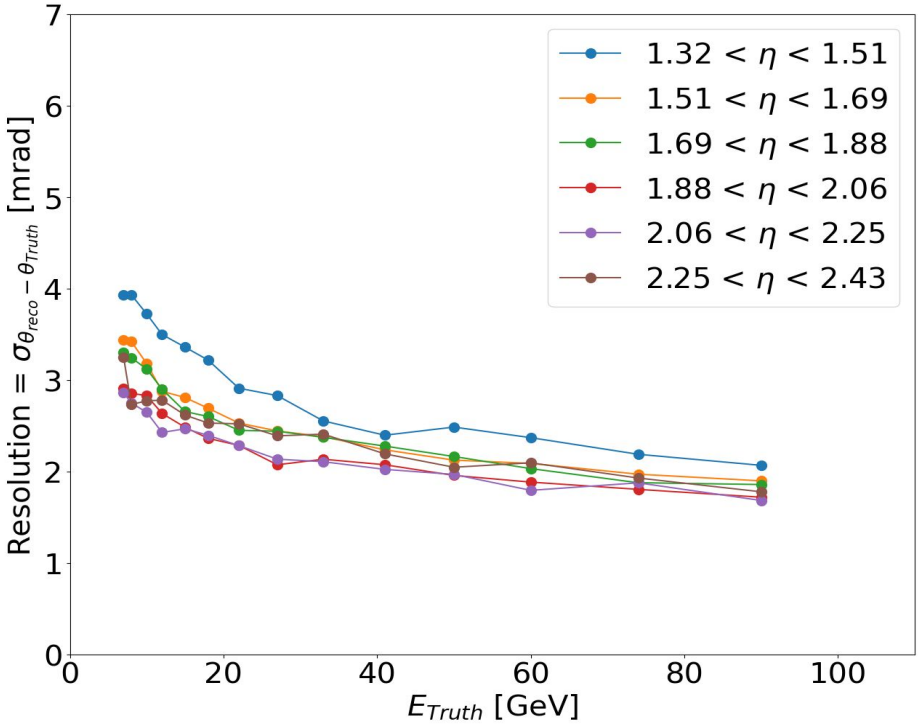


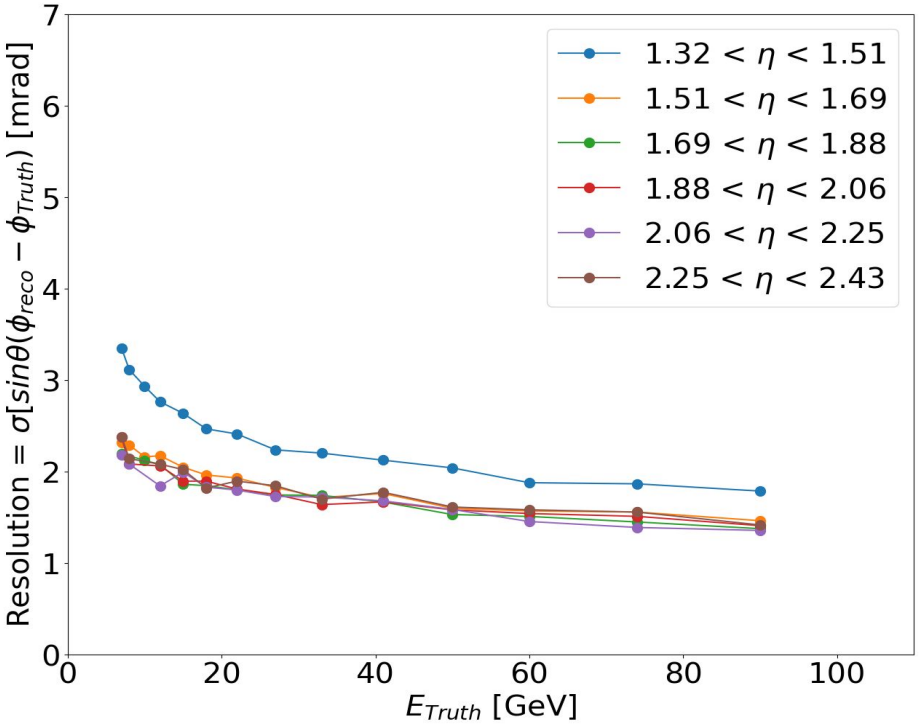


- We can see some edge effect (theta resolution)
- I do not understand azimuthal resolution, but other configuration phi resolution remains constant with **η** (see following slides)

HCAL (4W) Angular resolution using Graphnet at different η

With ECAL

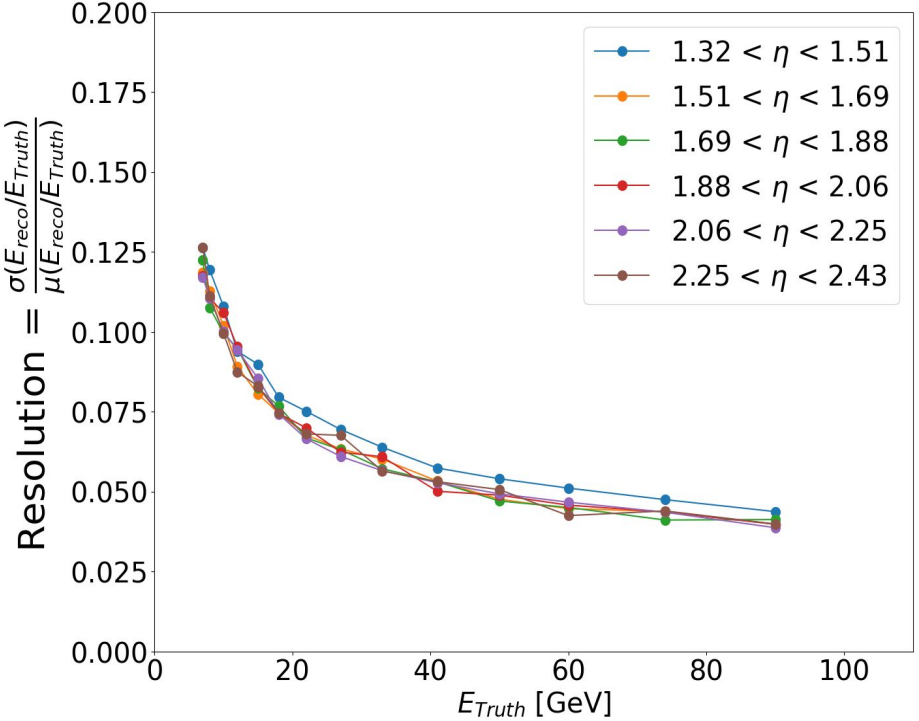


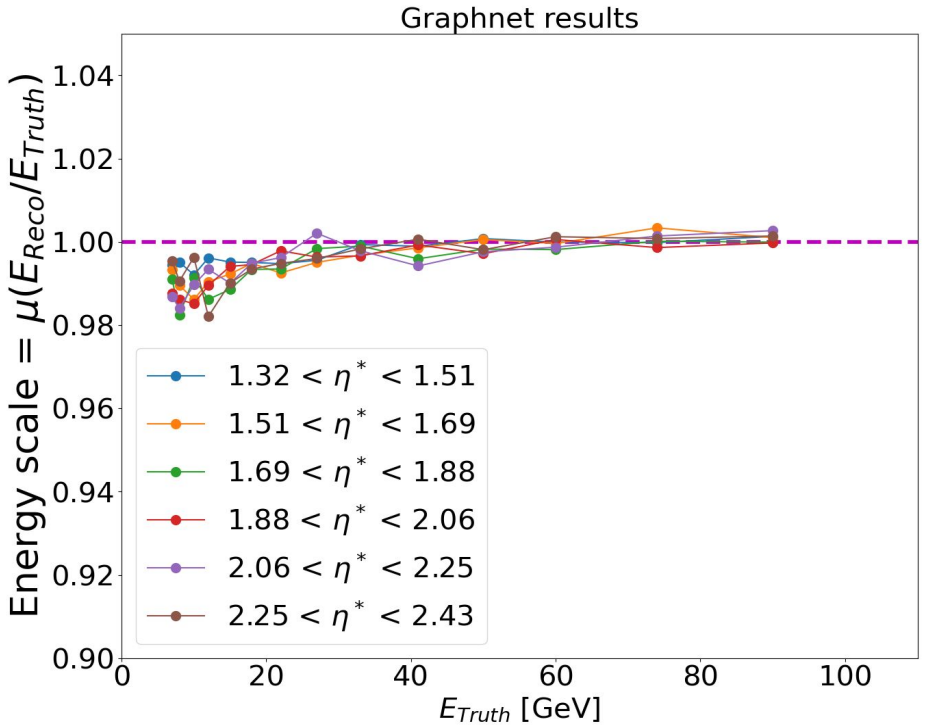


We can see some edge effect but over broad range of η resolution remains contant

HCAL (0W) Performance at different η

Without ECAL

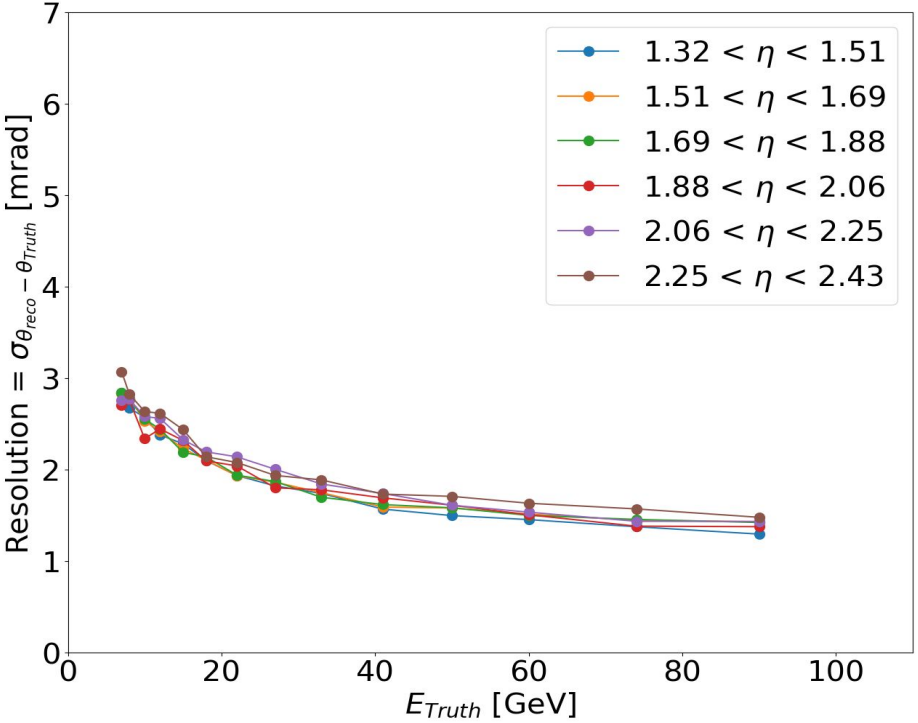


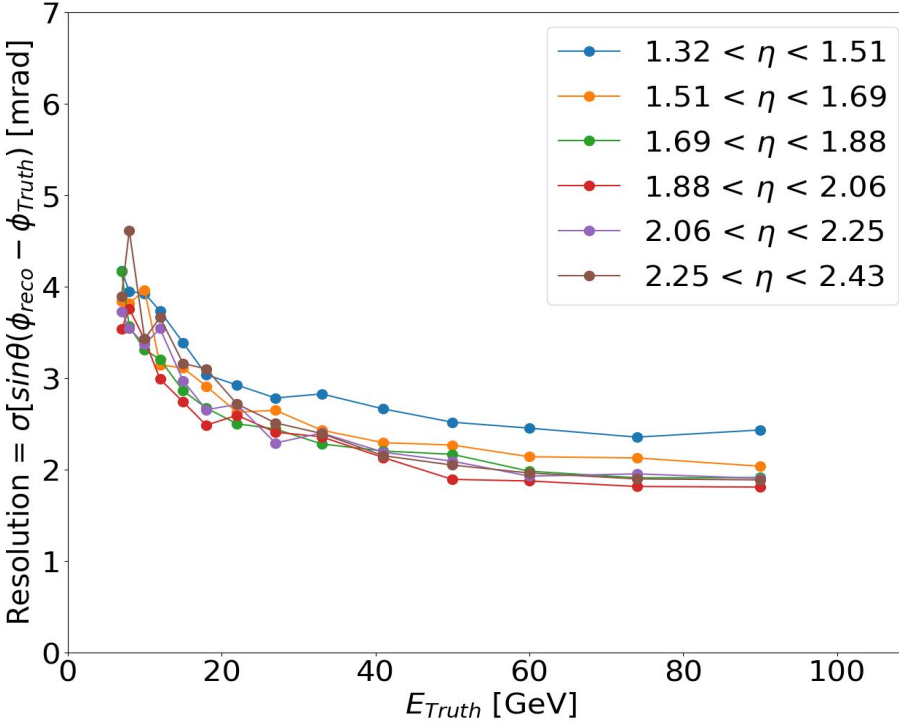


We can see some edge effect but over broad range of η resolution remains contant

HCAL (0W) Angular resolution using Graphnet at different η

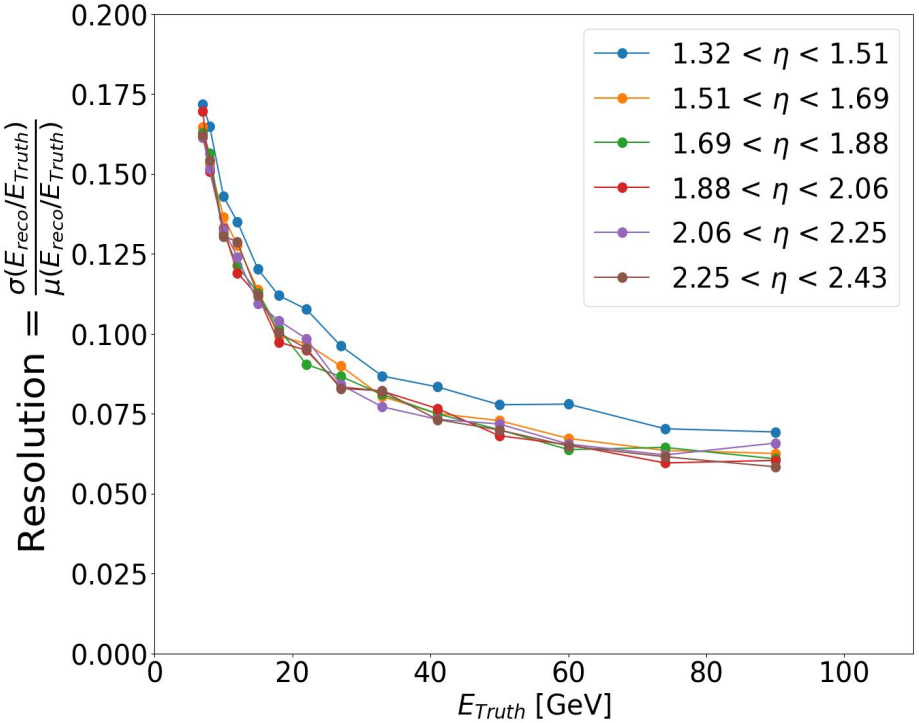
Without ECAL

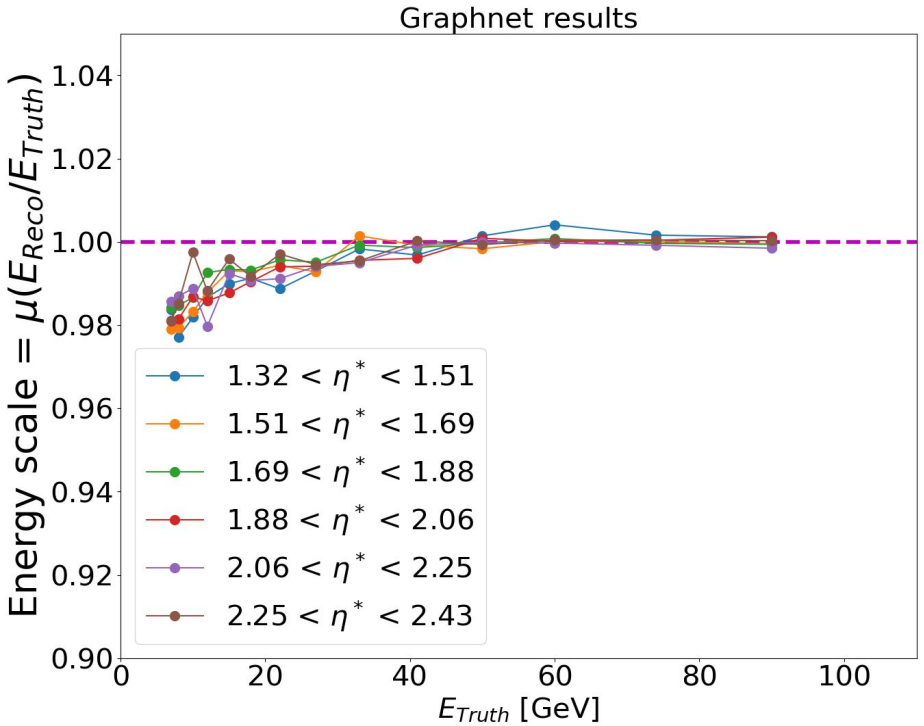




Without ECAL the edge effect is insignificant for same range of polar angle 10 -30 deg

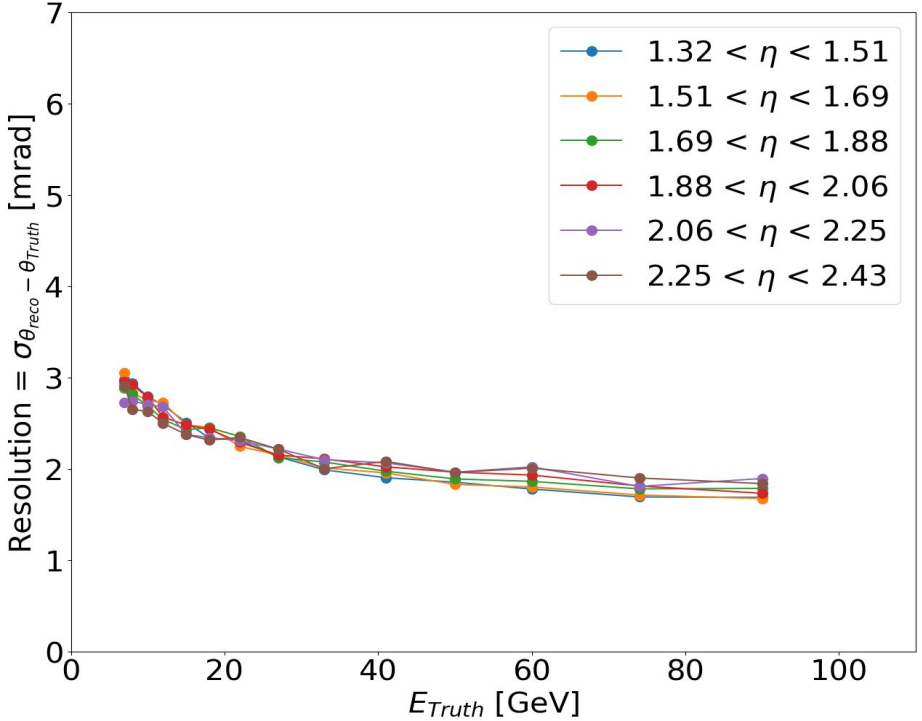
HCAL (4W) Performance at different η
Without ECAL

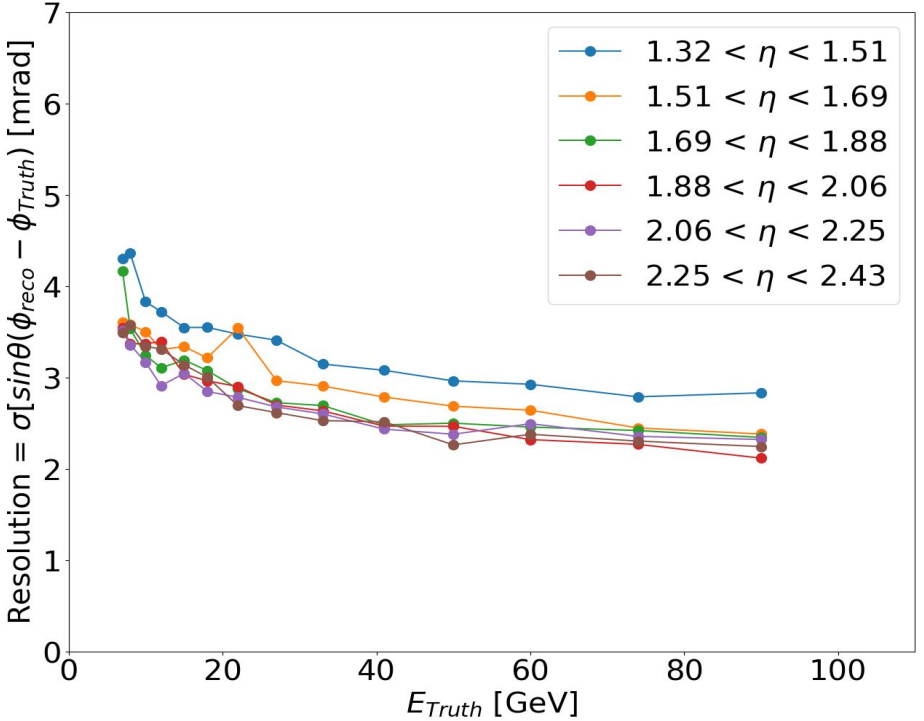




HCAL (4W) Angular resolution using Graphnet at different η

Without ECAL





Without ECAL the edge effect is insignificant for same range of polar angle 10 -30 deg

Summary

- Differential studies show similar picture than before.
  W improvement in azimuthal angle (not polar), and significant degradation in energy resolution
- Resolution is at the level of ~2 to 4 mrad for charged pions measured in ECAL + HCAL. At 3600 mm, this corresponds to ~7.2 to 14.4 mm.

Some thoughts:

- Angular resolution is in any scenario pretty good.
- Resolution performance is driven by ECAL (most charged pions interact in ECAL)
-One can think of W layer as “ECAL extension”.