

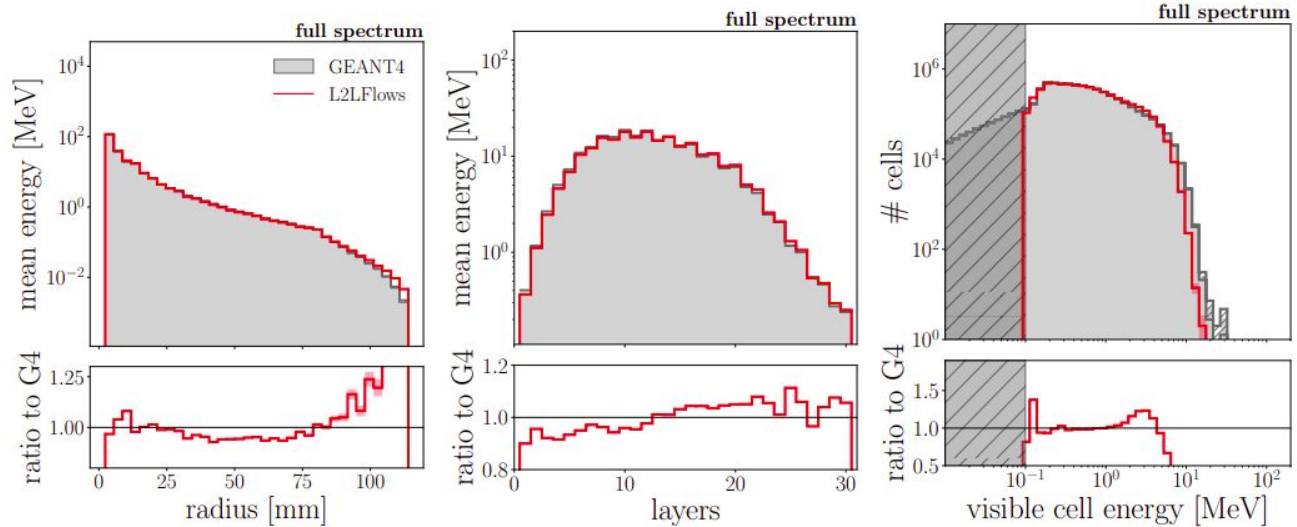
# CERN-DESY Fast Sim meeting

## DESY Update

Anatolii Korol  
04.09.2024



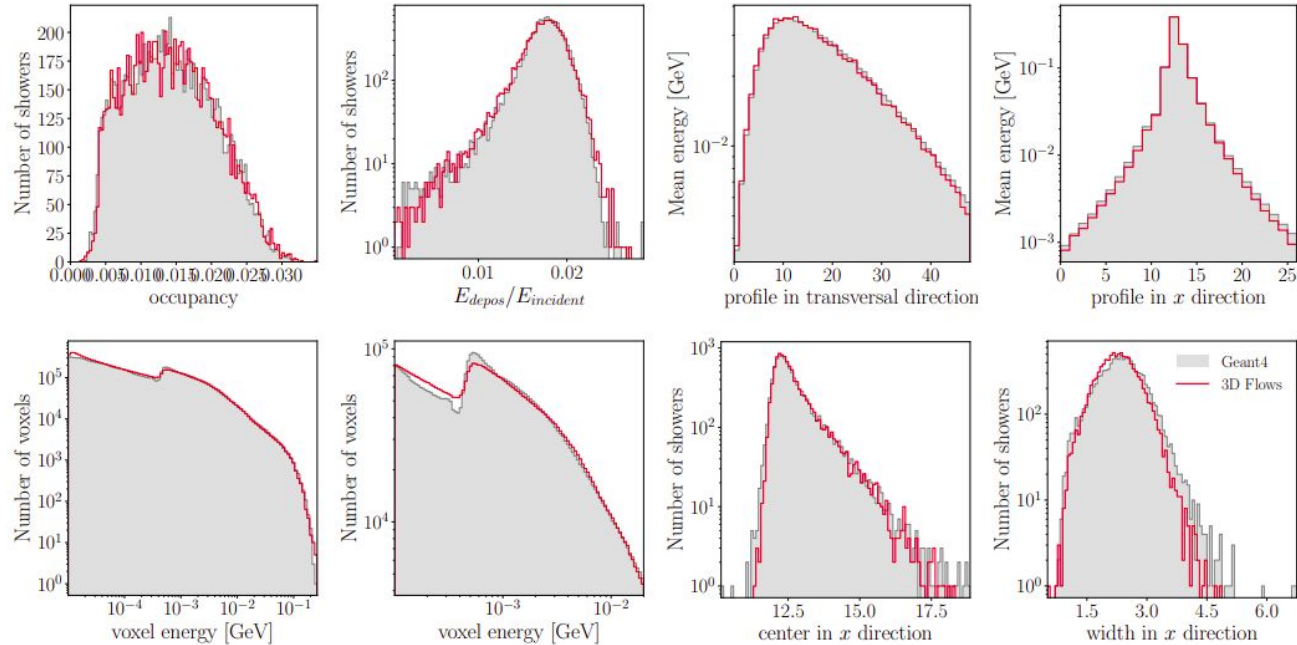
### Photons Integrated



### Pions – 3D Convolutional Flow



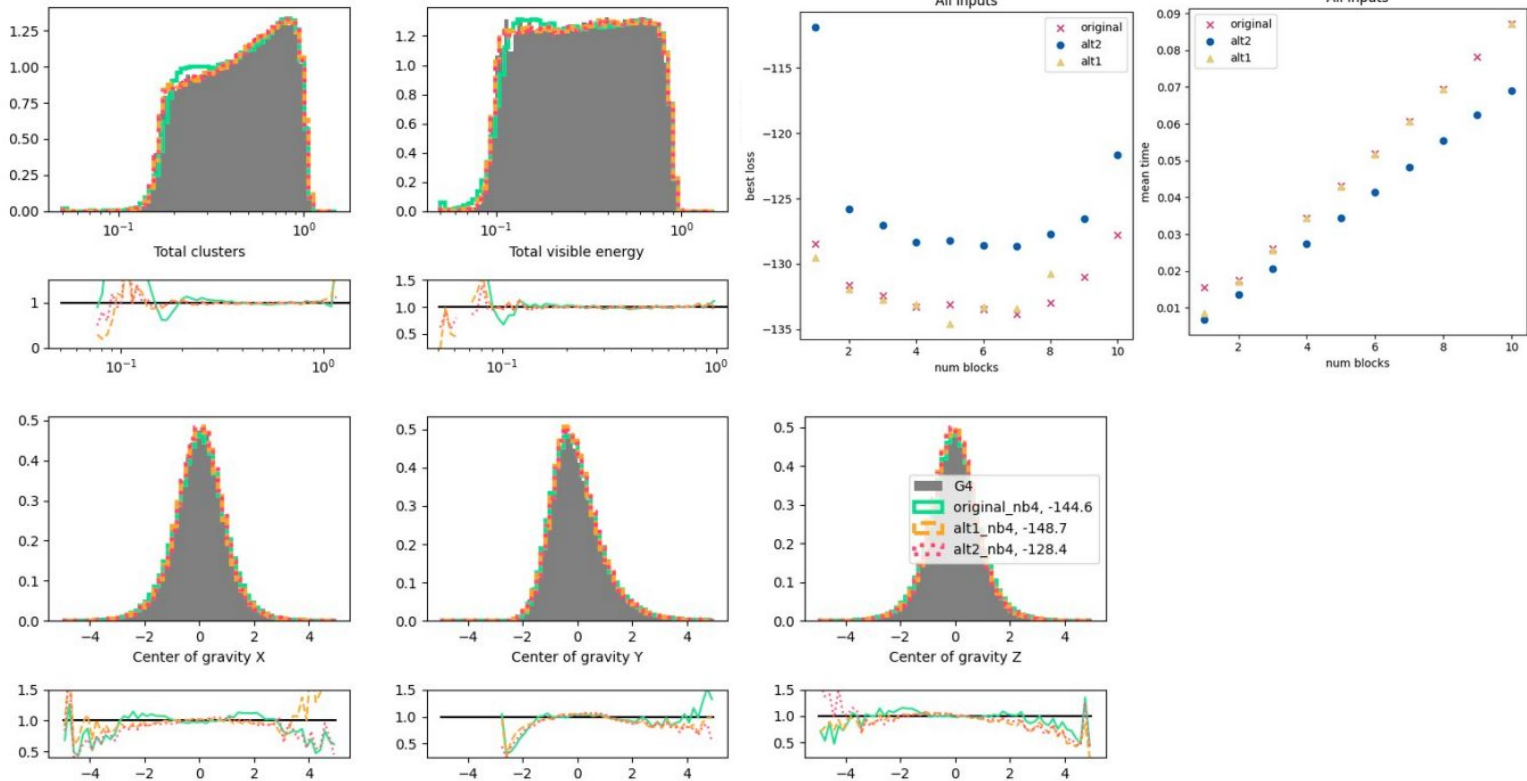
Universität Hamburg  
DER FORSCHUNG | DER LEHRE | DER BILDUNG



# ShowerFlow

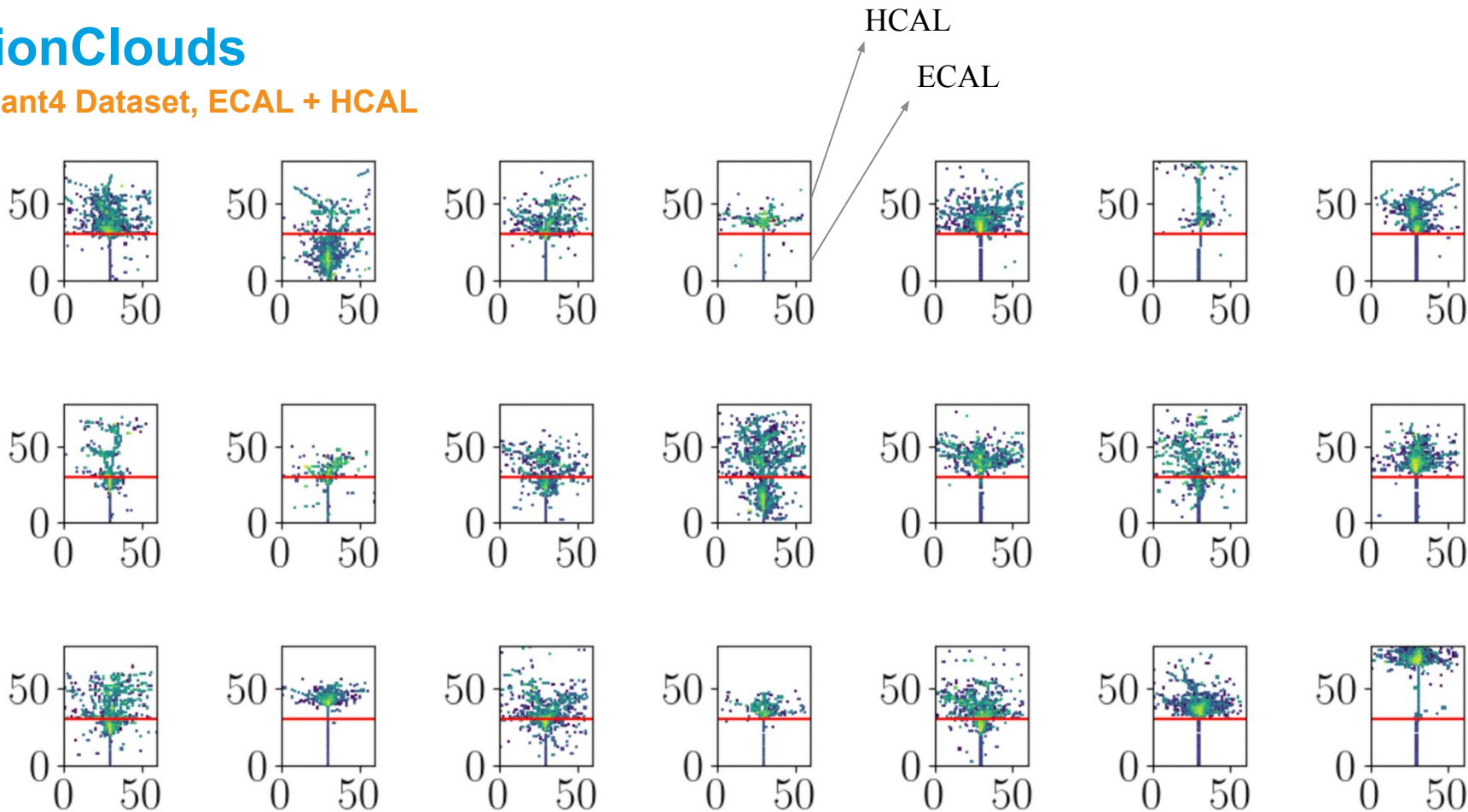
## Aiming at Reducing Compute Time with Reduced Complexity

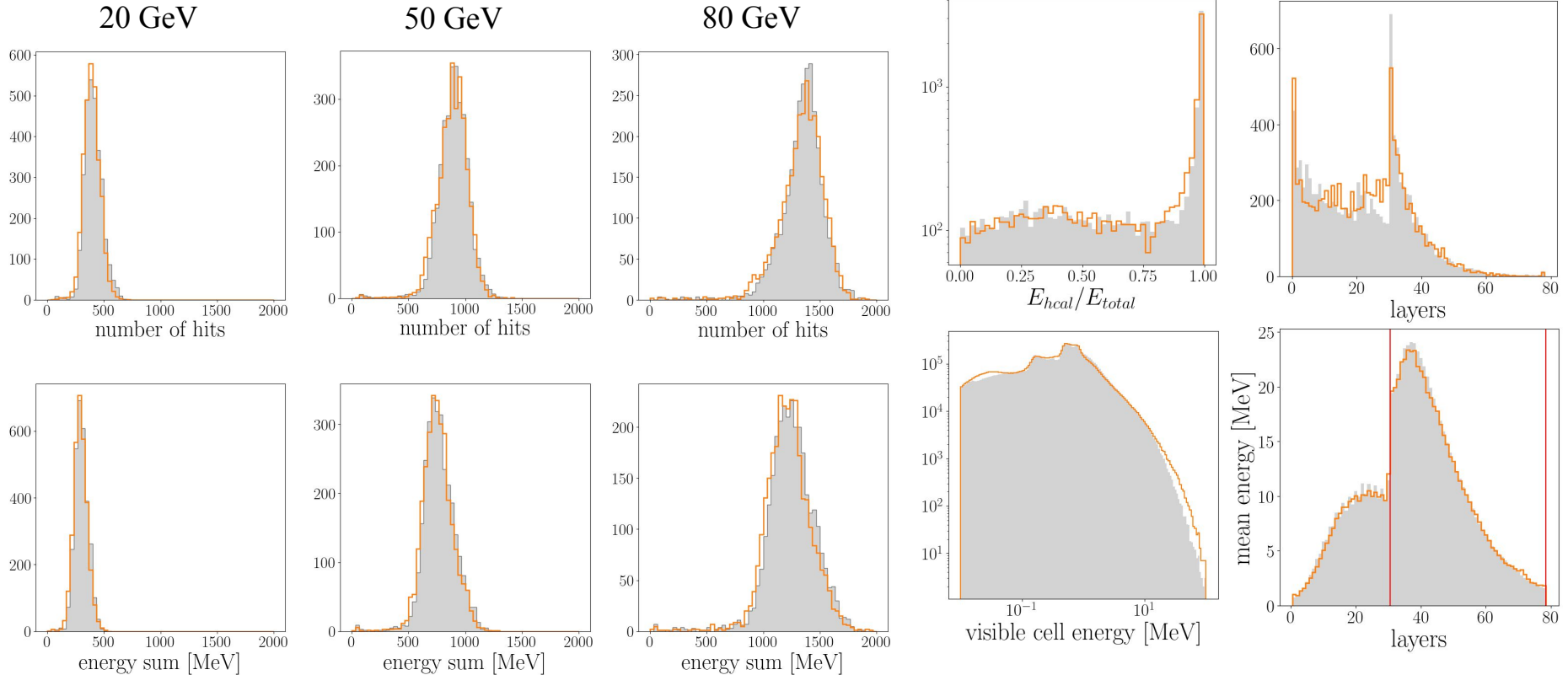
Henry Day-Hall



# PionClouds

## Geant4 Dataset, ECAL + HCAL



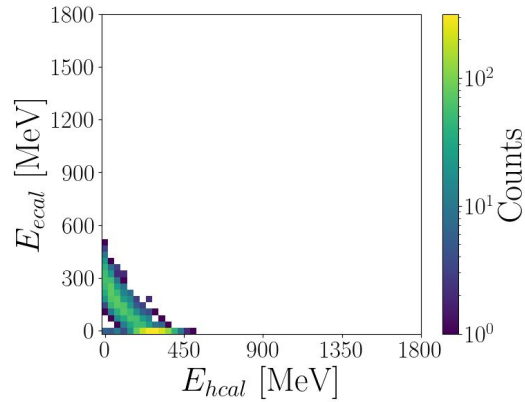


# PionClouds

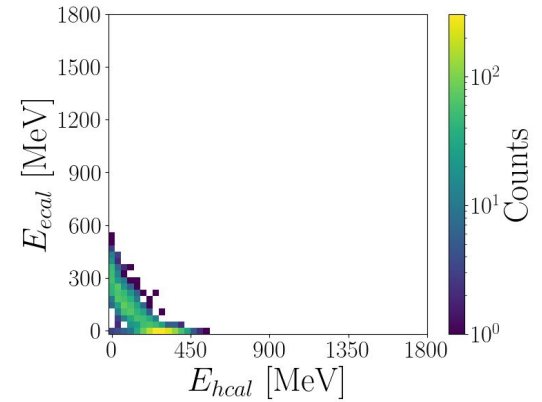
## Fraction of Energy in ECAL and HCAL

20 GeV

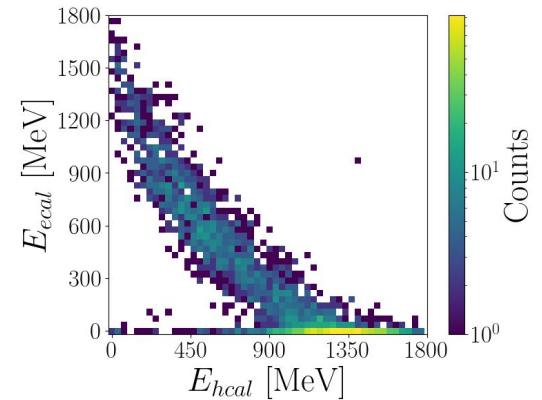
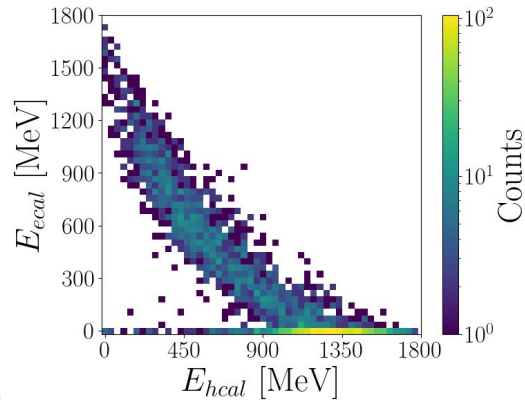
Geant4



PionClouds



80 GeV



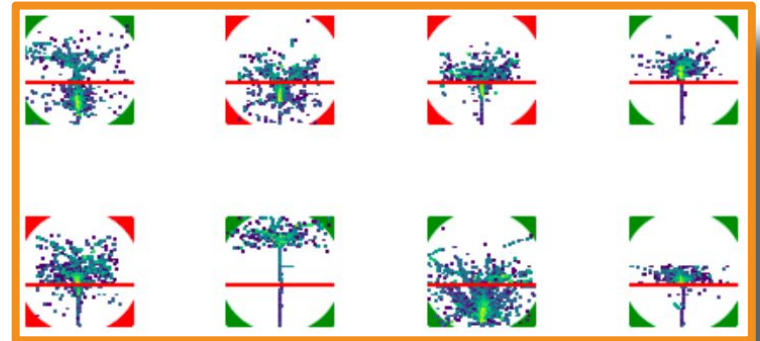
# Conclusion

- L2L Flow integrated into DDML (we have already 3 models to compare)
- ShowerFlow reduced complexity thus inference time (potential CaloClouds speed by x2)
- PionClouds model, using an all-to-all attention mechanism seems to work quite well

## Next Steps

- PionClouds Writeup
- More data (the dataset was only 200k showers)
- Reconstruction performance
- Distillation

Visual comparison: **red** PionClouds, **green** Geant4





**BACKUP**

# PionClouds

## Model, All to All Attention

