

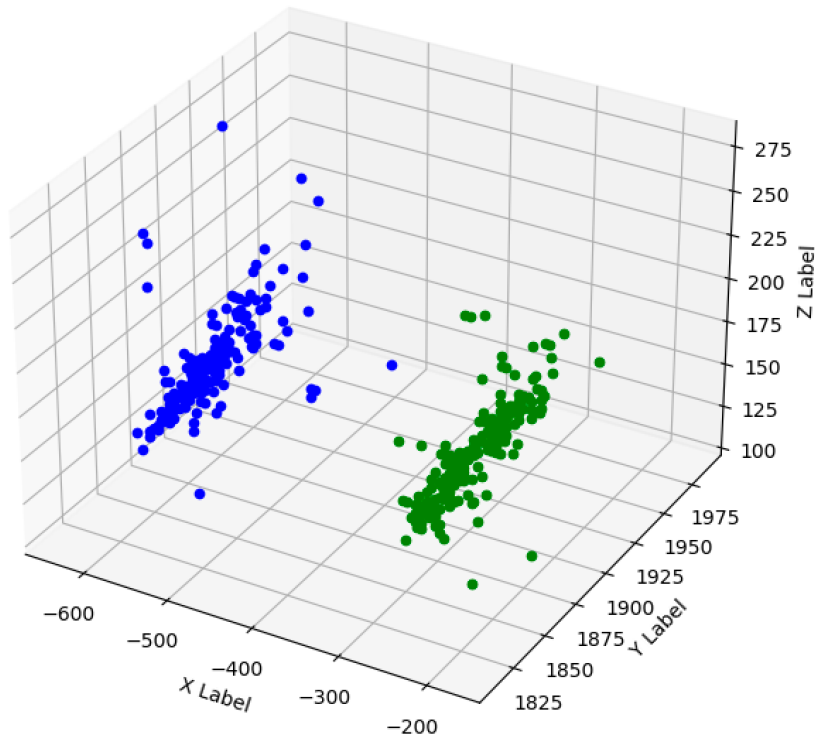
# Physics Software 1/18

Shusaku Tsumura

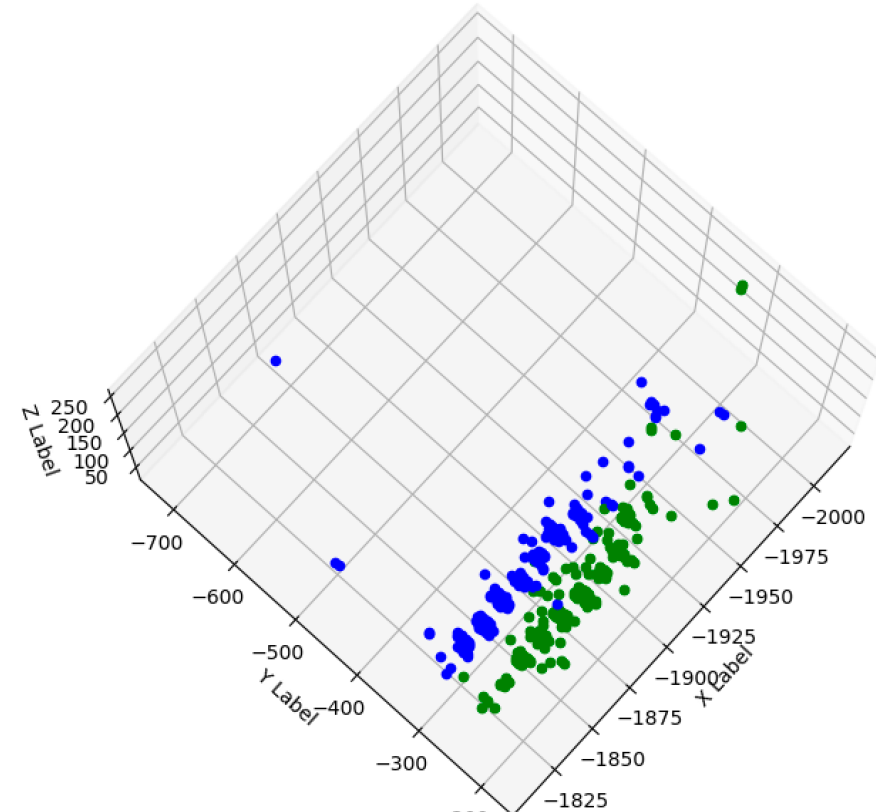
# Display of Double Particle

- Two gamma rays are injected ( in 5 cases of different angles)

The easiest case :

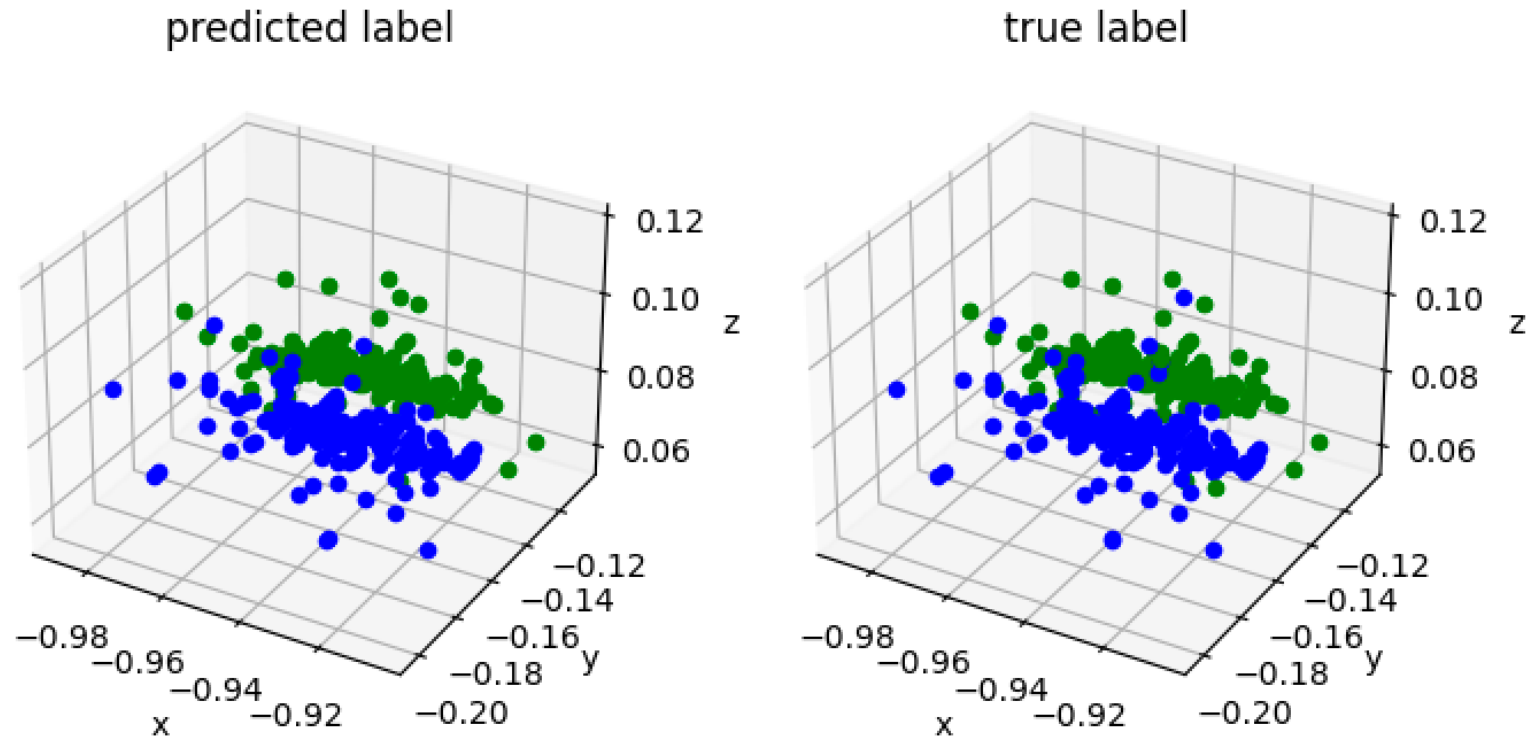


The most difficult case :



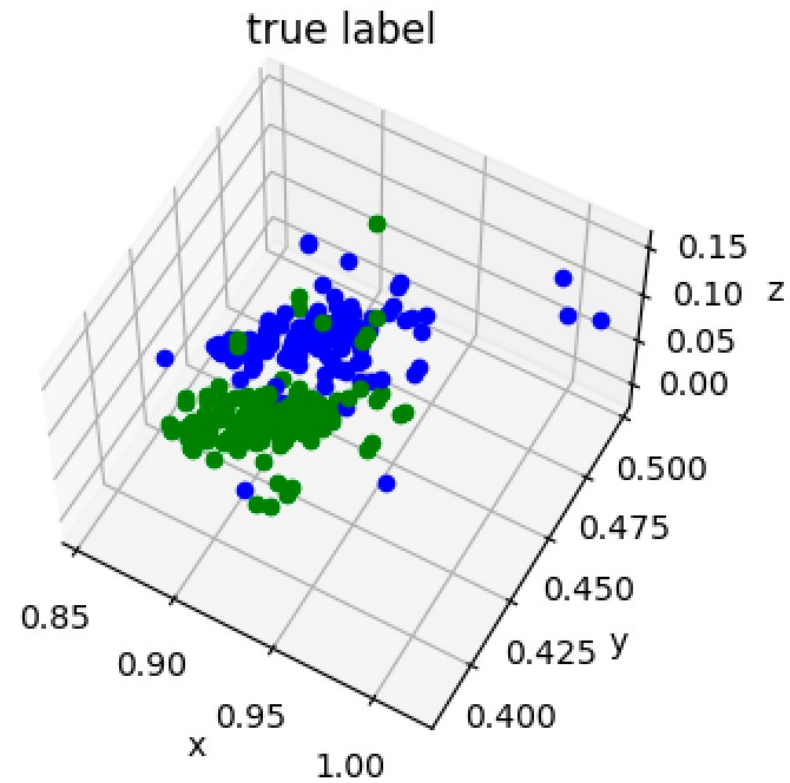
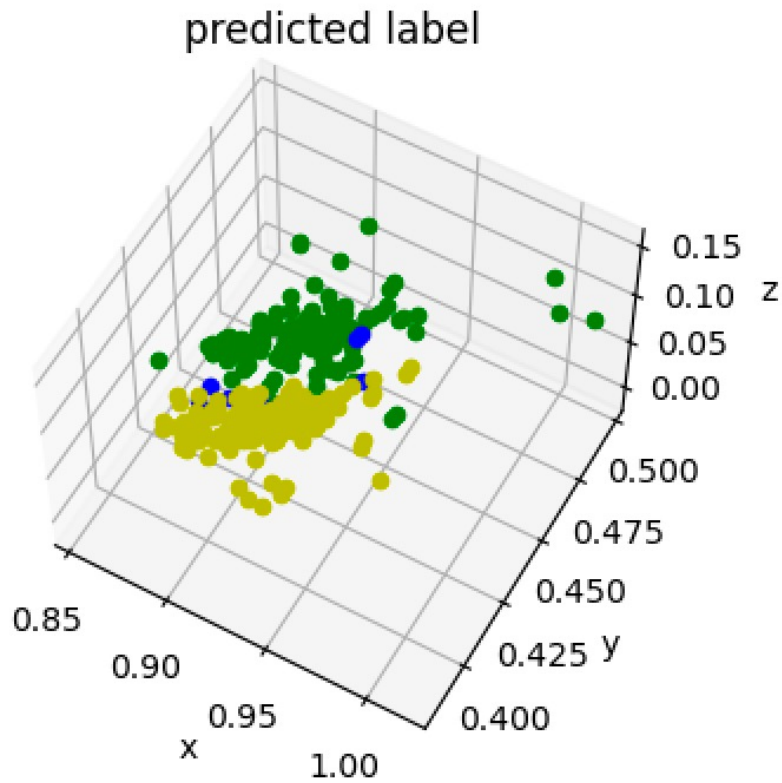
# Comparison between prediction and true label

Good case :



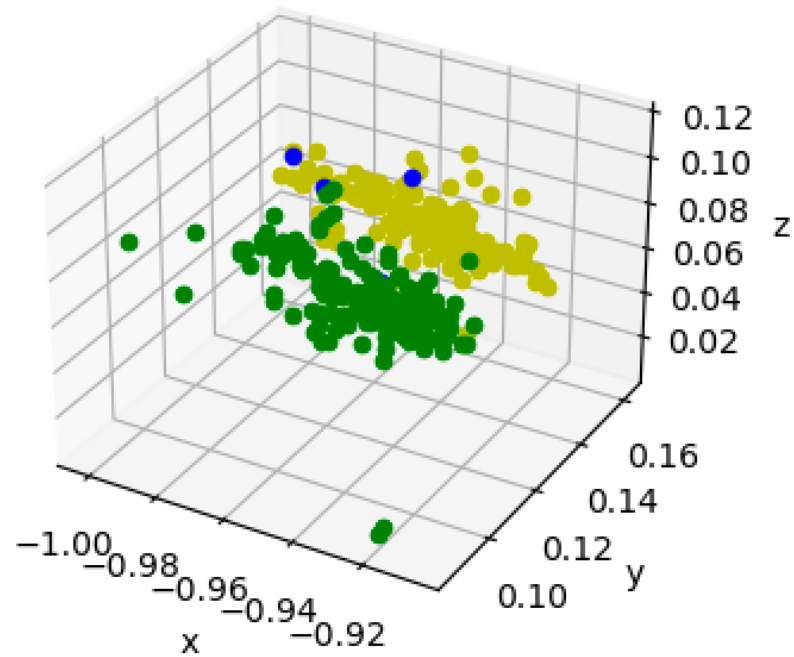
# Comparison between prediction and true label

The most case :

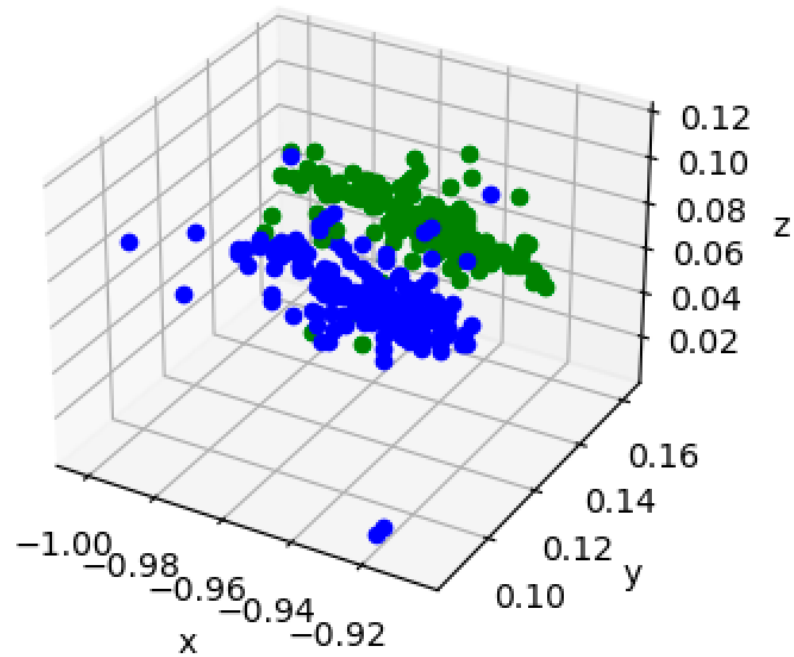


# Comparison between prediction and true label

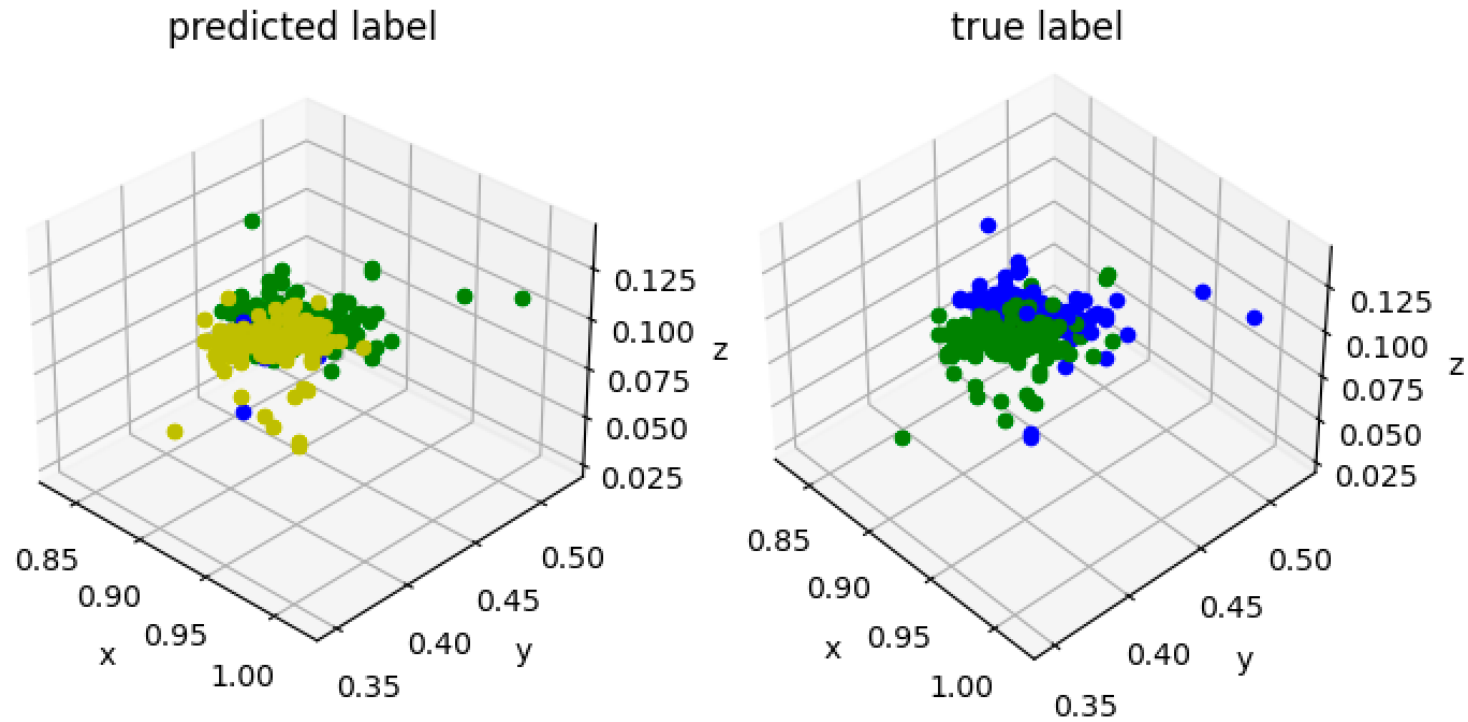
predicted label



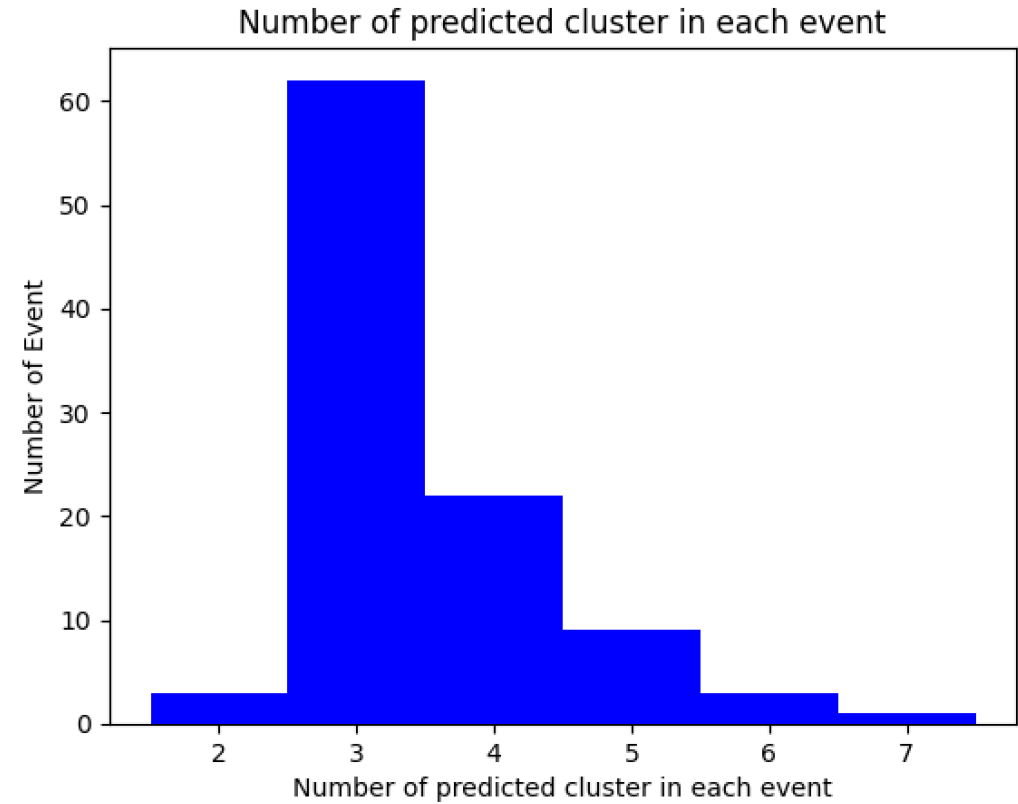
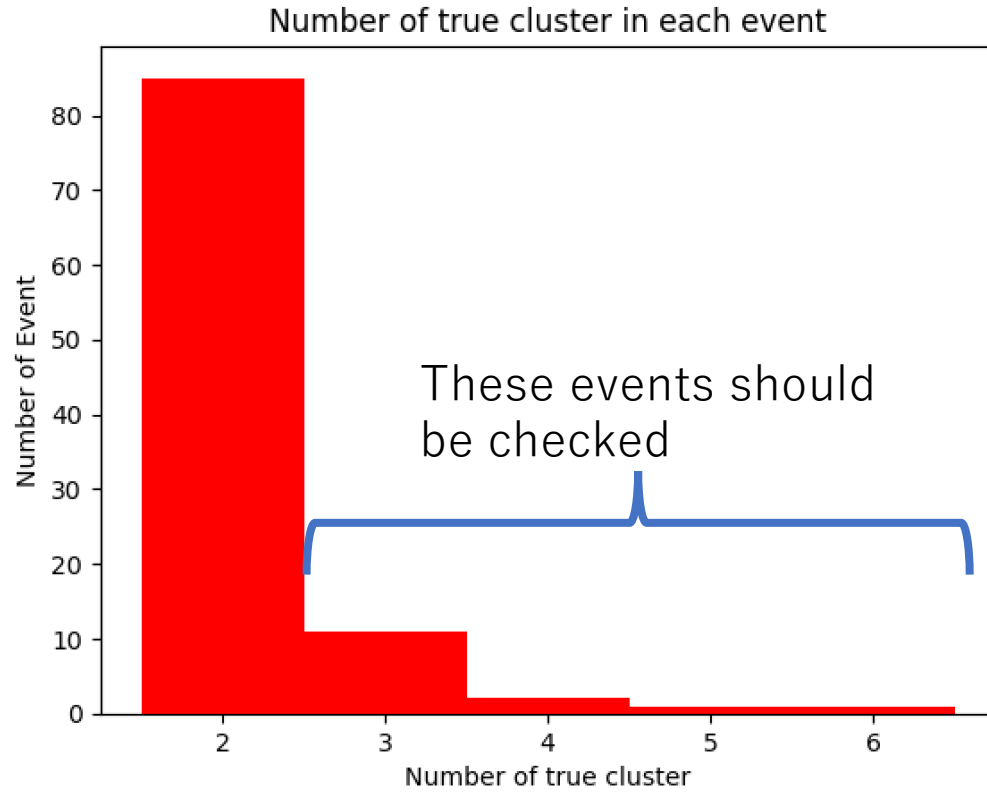
true label



# Comparison between prediction and true label



# Number of cluster in each event(Just 100 events)



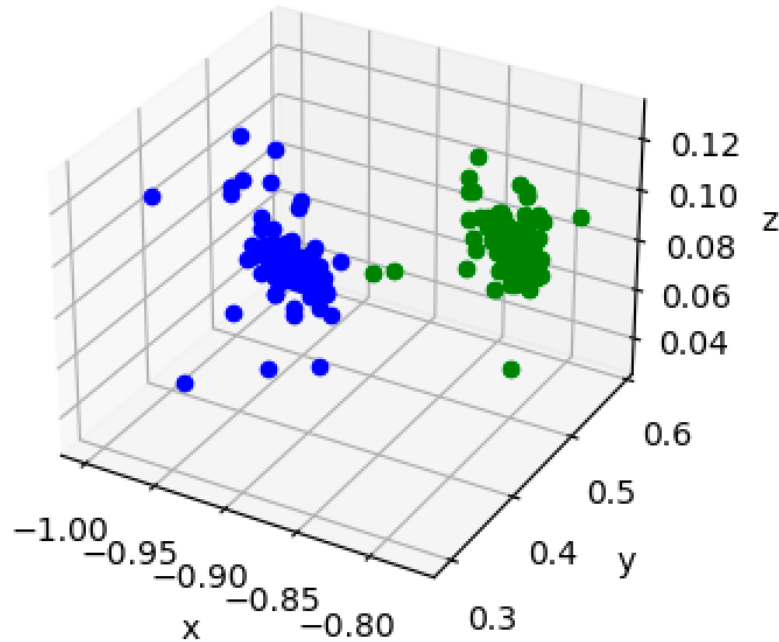
backup



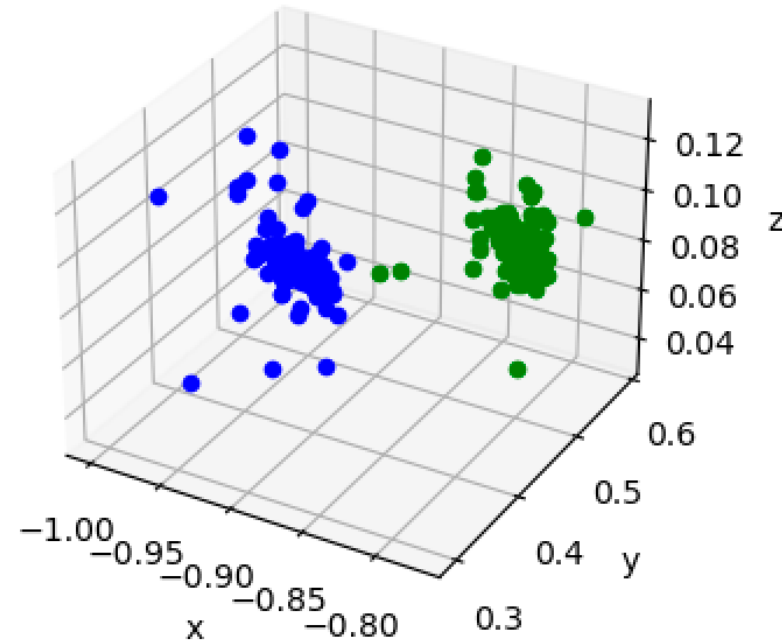
# Comparison between prediction and true label

Good example :

predicted label

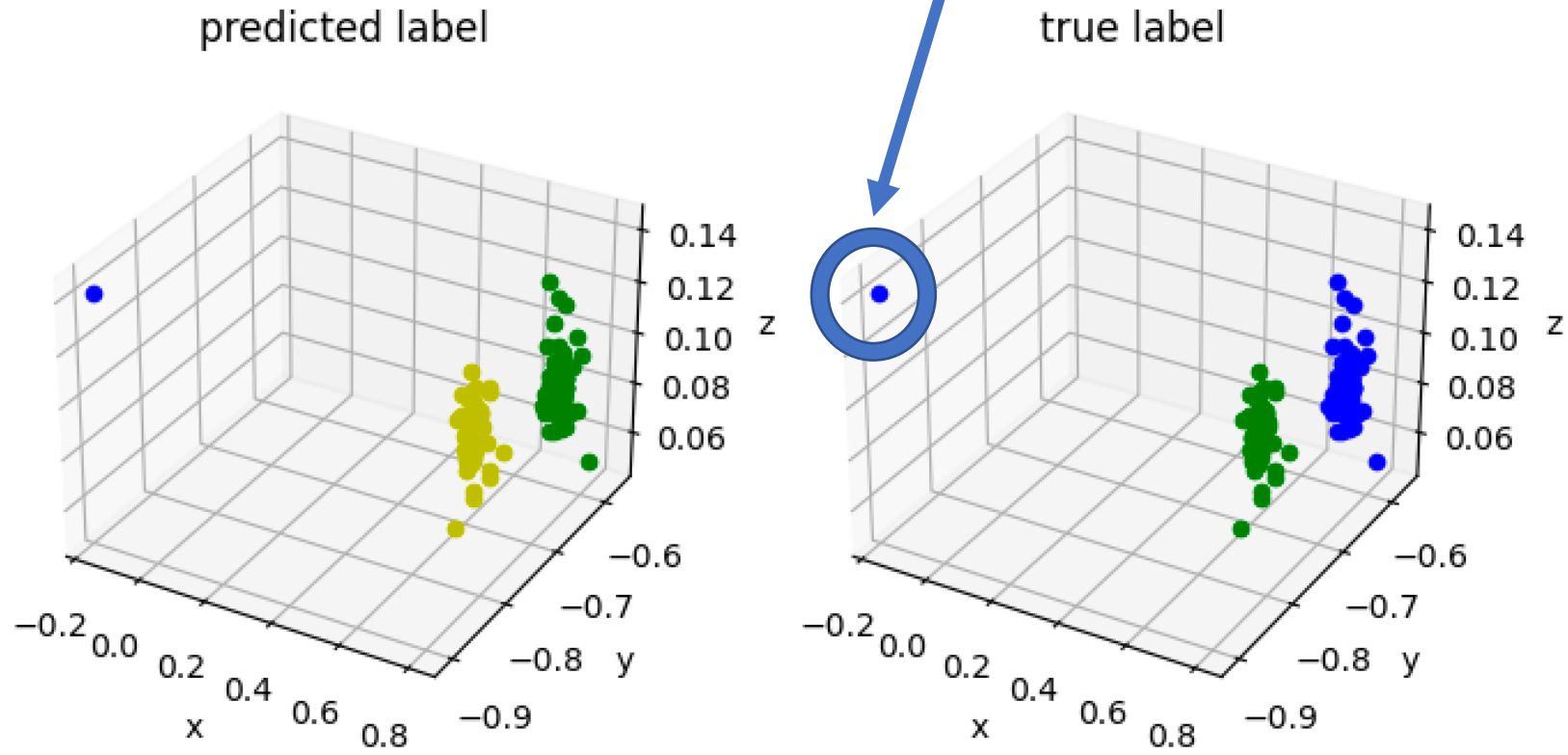


true label



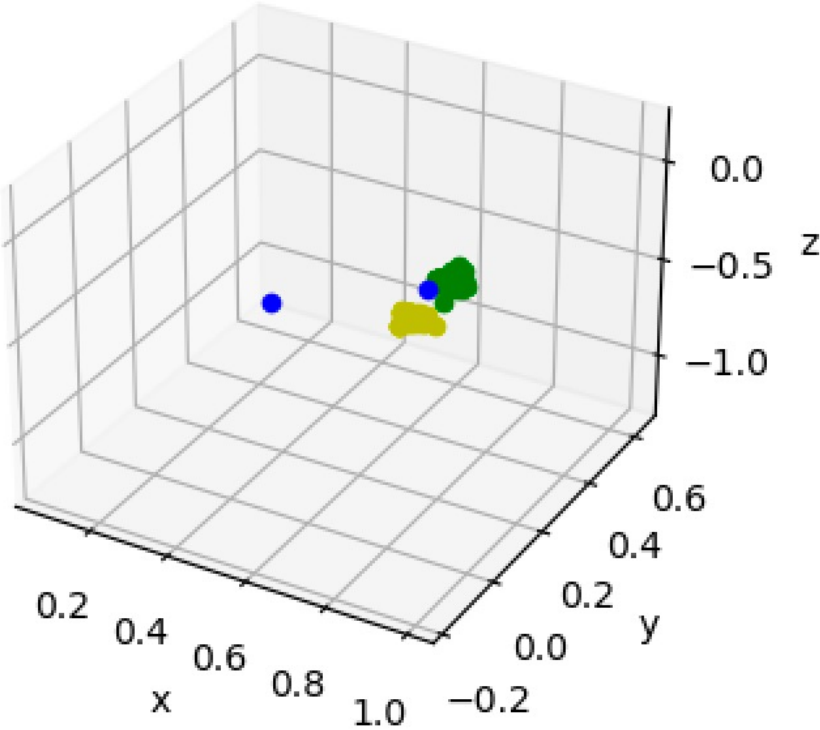
# Comparison between prediction and true label

The case in which there is a distant hit

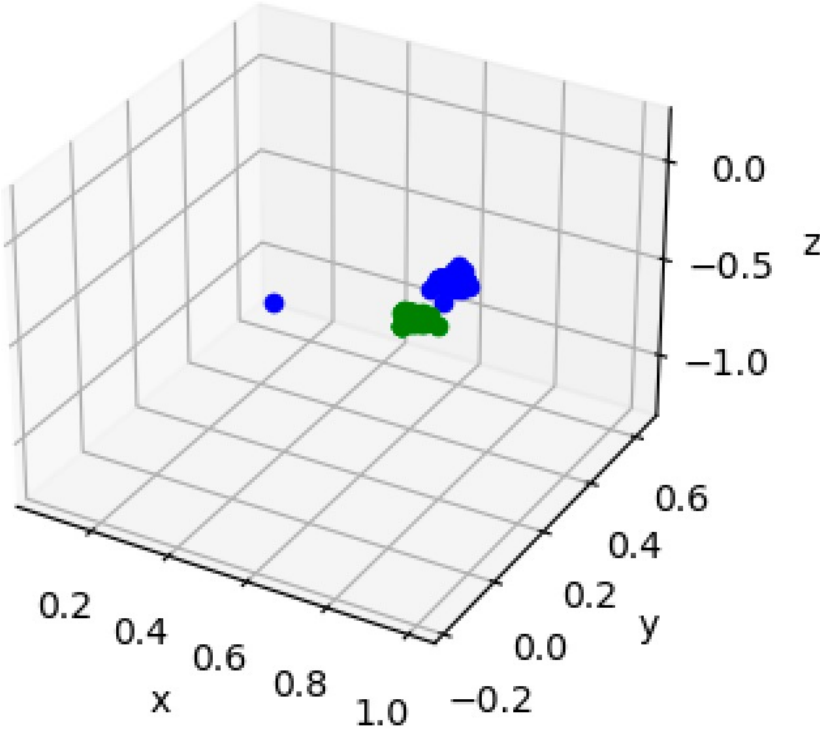


# Comparison between prediction and true label

predicted label

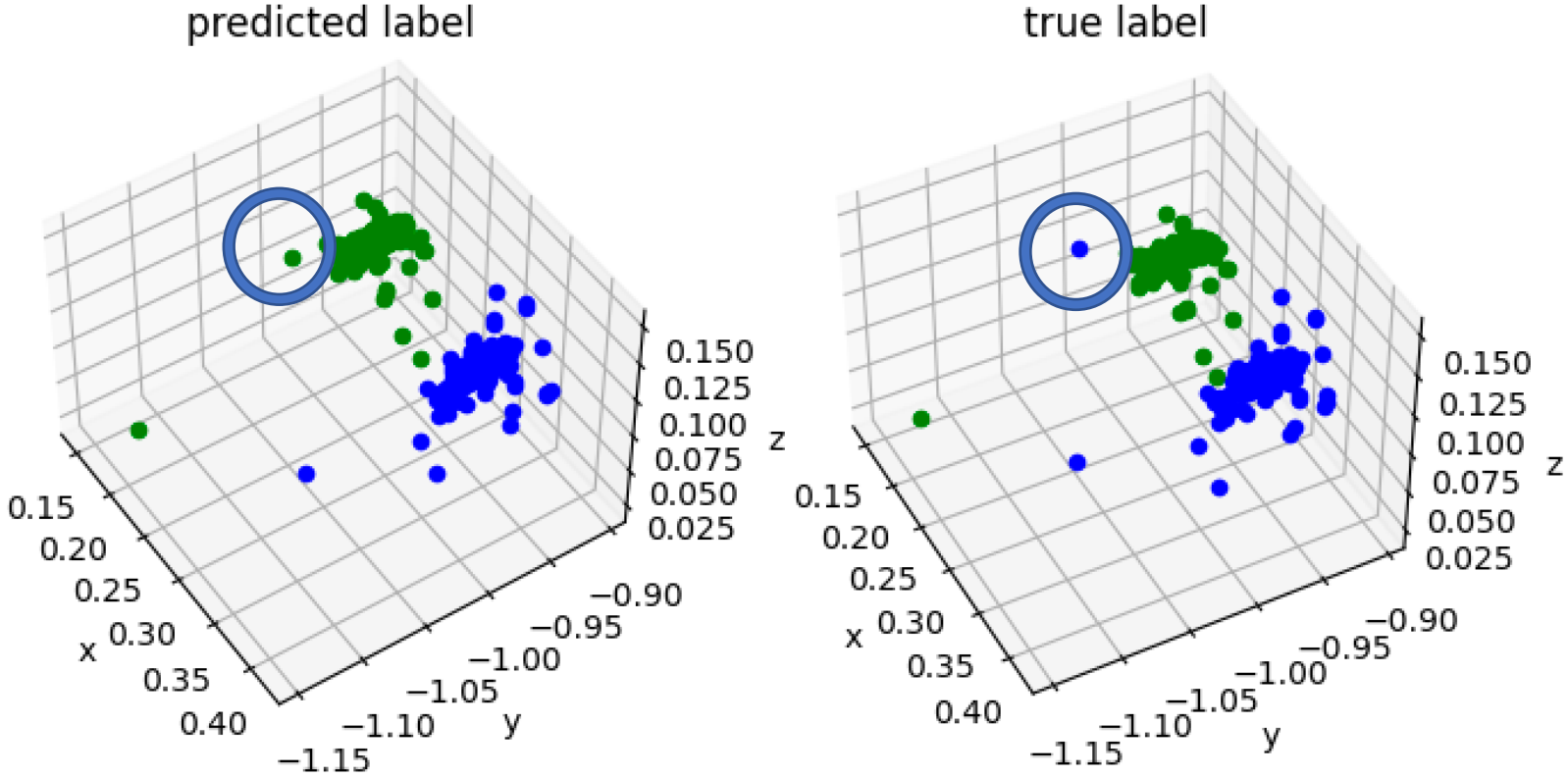


true label



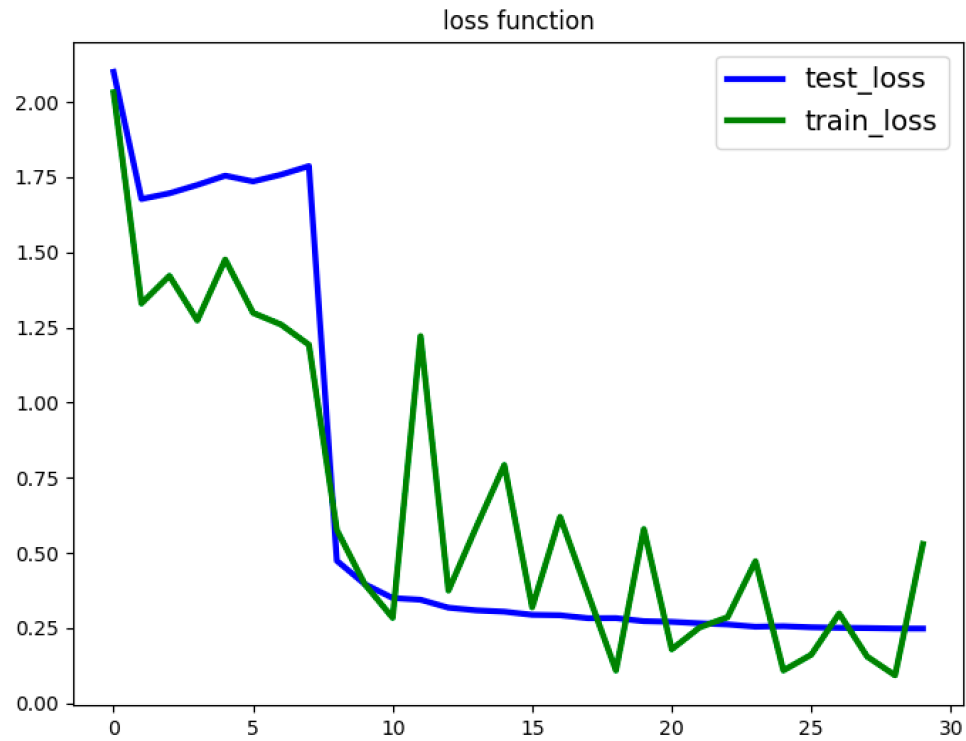
# Comparison between prediction and true label

Confusion example :



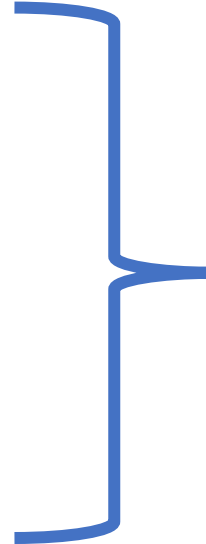
# Learning

- The easiest case :



# GravNet

- kekcc : 1 hour  
lcio\_particle\_gun.py 1000 events \*100 →bsub 100 times  
(Generation of double particles)  
ddsim 100 files  
Marlin 100 files  
(Reconstruction)  
LCIO files → npz files(100000 files) : 20 min /1000 files  
(Conversion of files)
- kekcc → bepp 100000 files 2h → shorten to about 30 min
- Bepp  
GravNet training 23 min /4 batch • 1 epoch  
12 min /10 batch • 1 epoch →30 epoch 5h  
→ 6 min / 100 batch • 1 epoch



~30 GB  
in total