

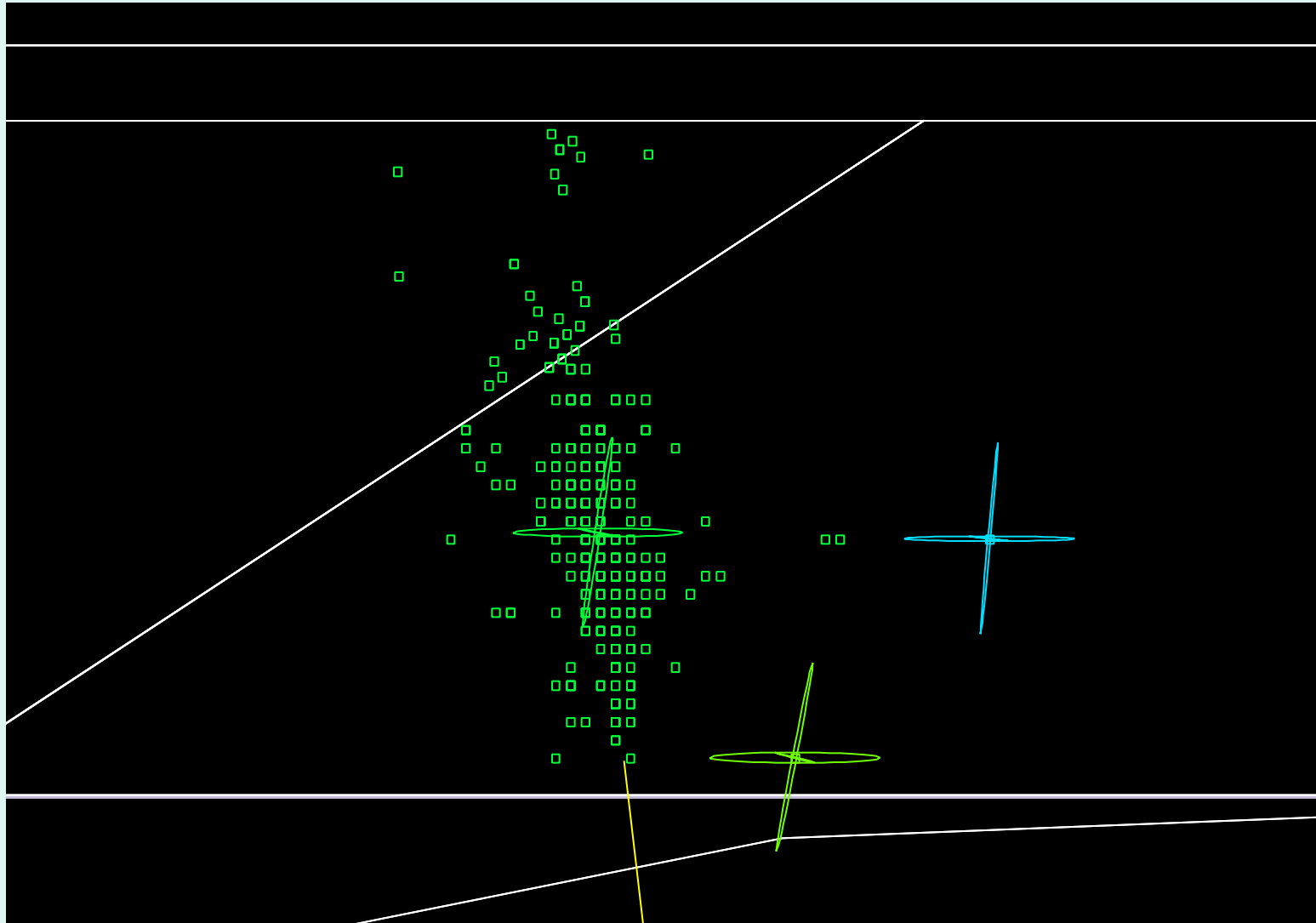
# Clustering across boundaries: sidloi2

Ron Cassell

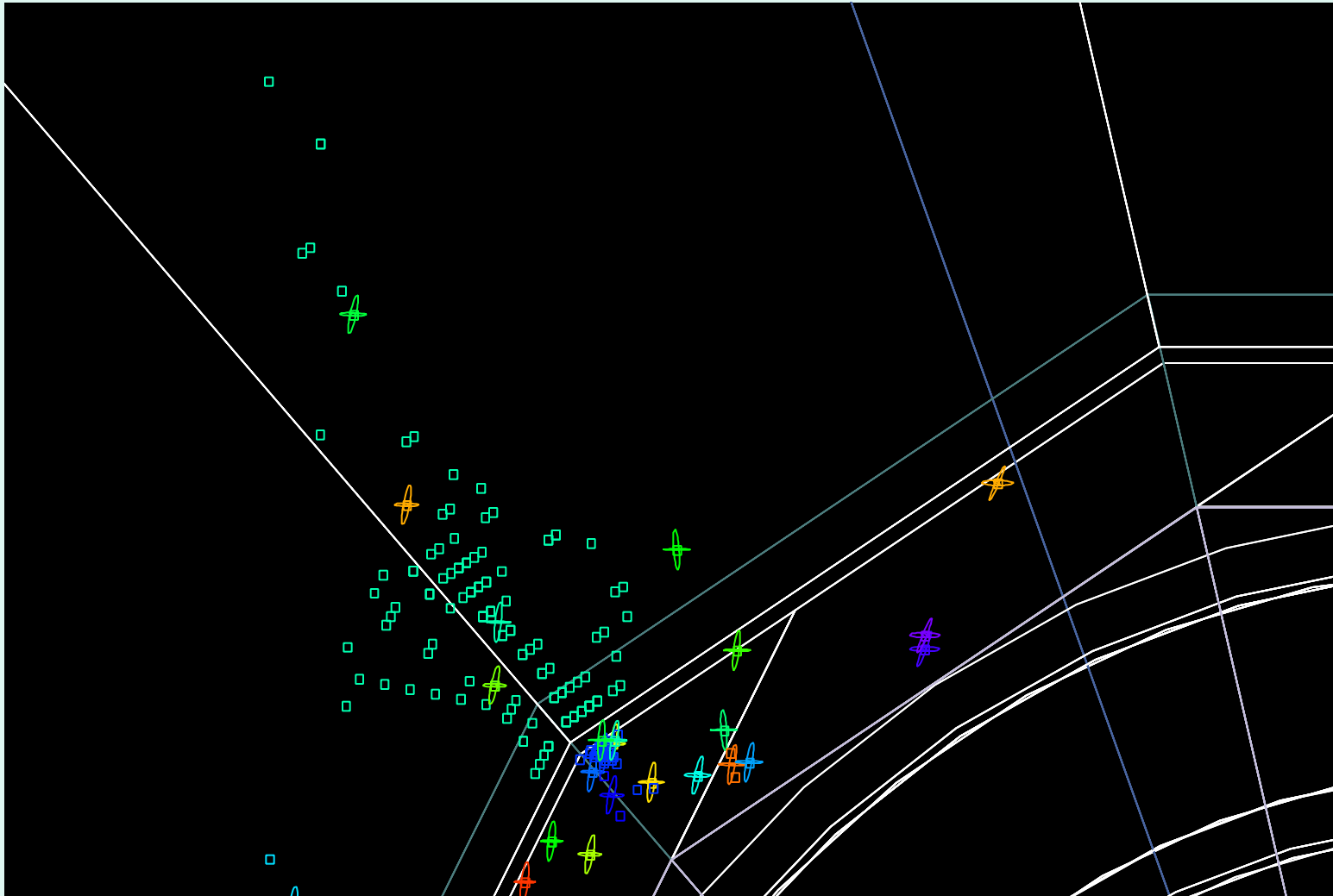
# GeomConverter

- Neighboring capability across borders added to segmentation classes of IDDecoders for calorimeter classes used in sidloi2.
- Need to check clusterers with polygonal calorimeters.

Example of 10 GeV photon crossing border of Ecal Barrel stave, with DT clustering



Example of 20 GeV K0L crossing border of Hcal Barrel,  
with DT clustering

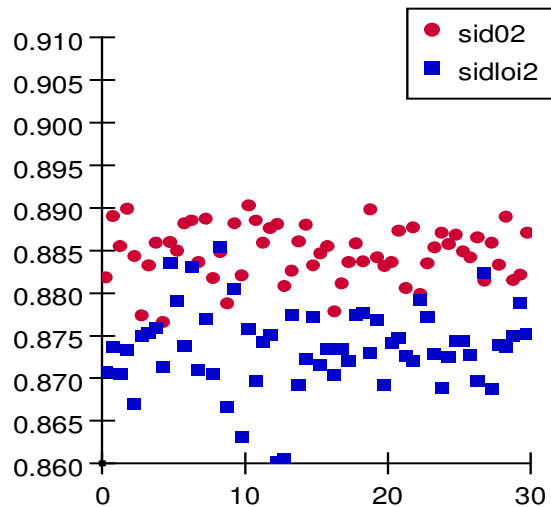


# Procedure

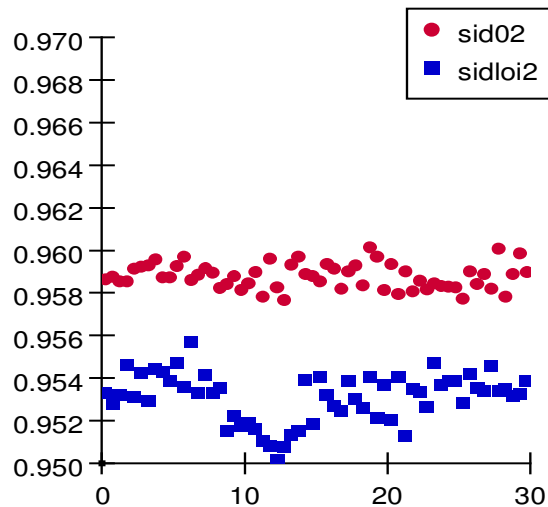
- Ran NN clusterer and DT clusterer on single photons and K0Ls at various energies and polar angles, for both sid02 and sidloi2.
- Defined efficiency as the energy in the largest cluster for a calorimeter divided by the total energy in that calorimeter.
- Plotted  $\langle \text{efficiency} \rangle$  vs  $\phi$ .

# NN331 clusters: $\langle \text{efficiency} \rangle$ vs $\phi$ (deg)

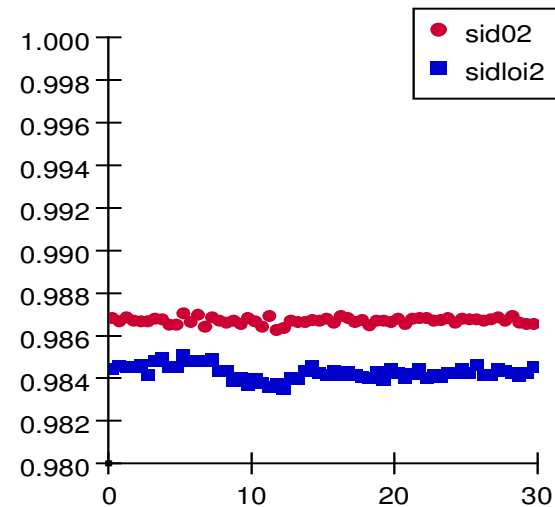
### Ecal Barrel: 1 GeV photons



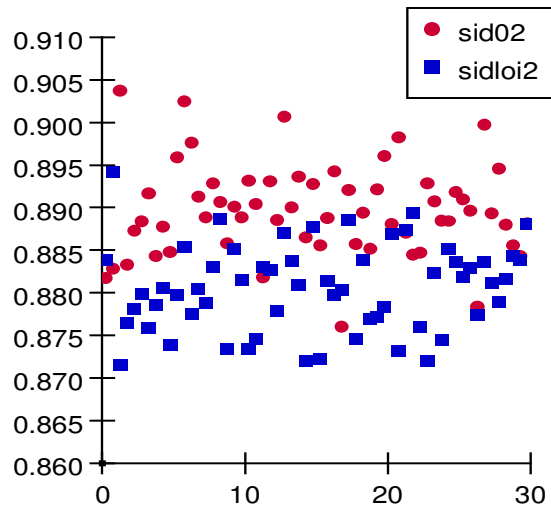
### 10 GeV photons



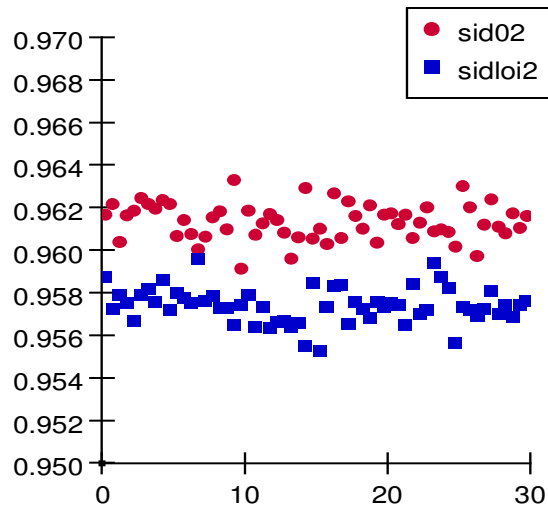
### 100 GeV photons



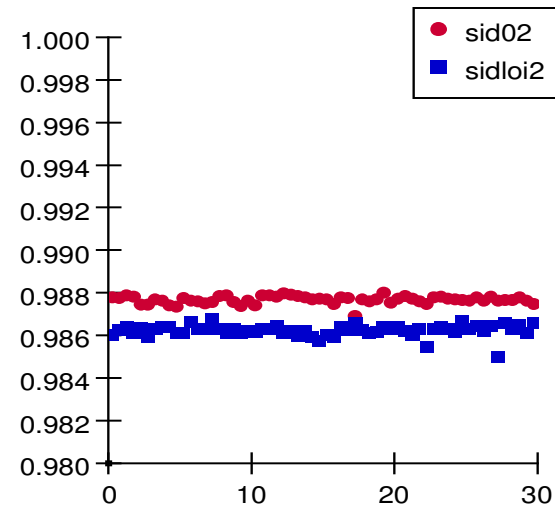
### Ecal Endcap: 1 GeV photons



### 10 GeV photons

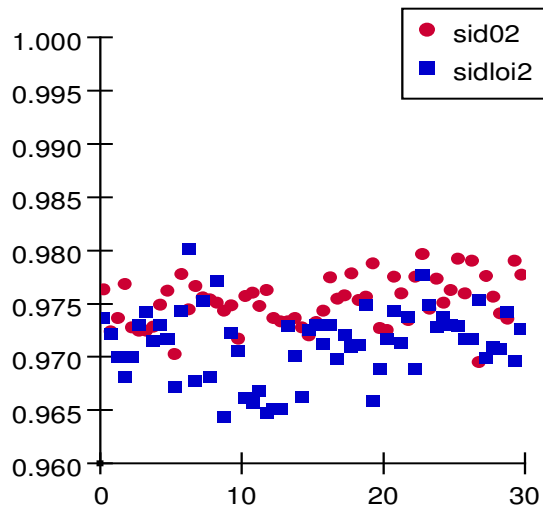


### 100 GeV photons

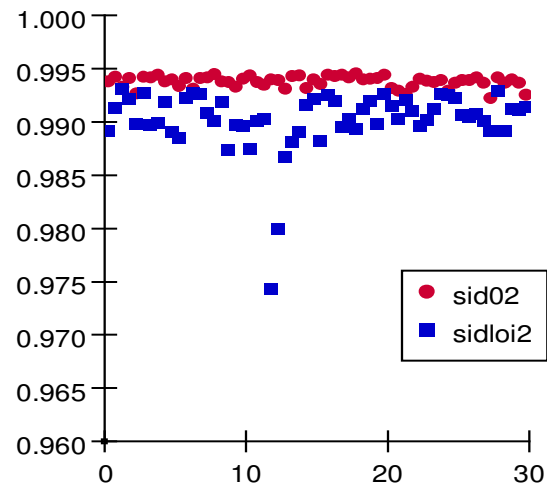


# DT clusters: <efficiency> vs phi (deg)

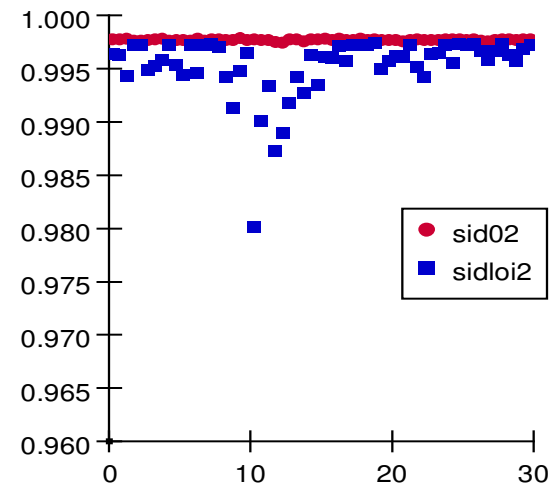
### Ecal Barrel: 1 GeV photons



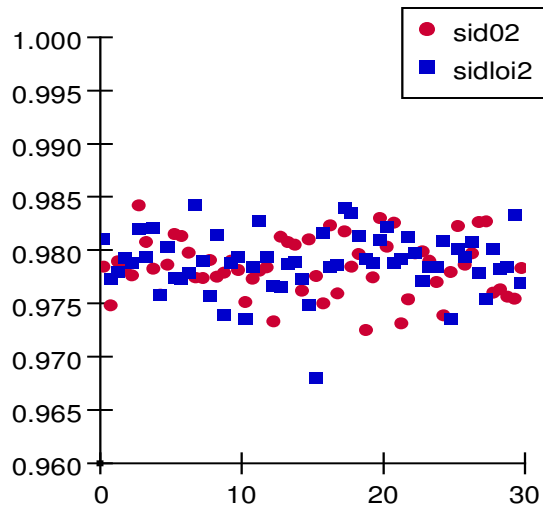
### 10 GeV photons



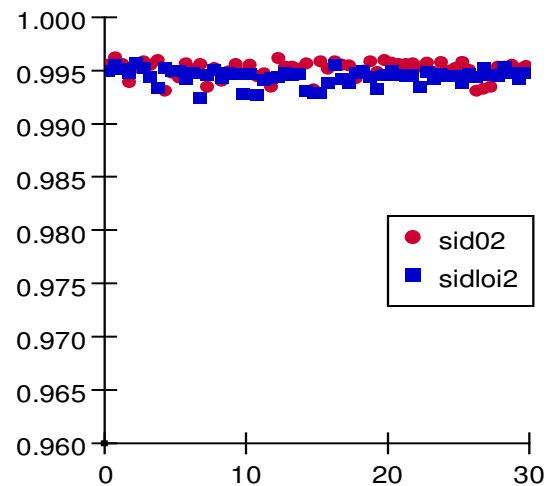
### 100 GeV photons



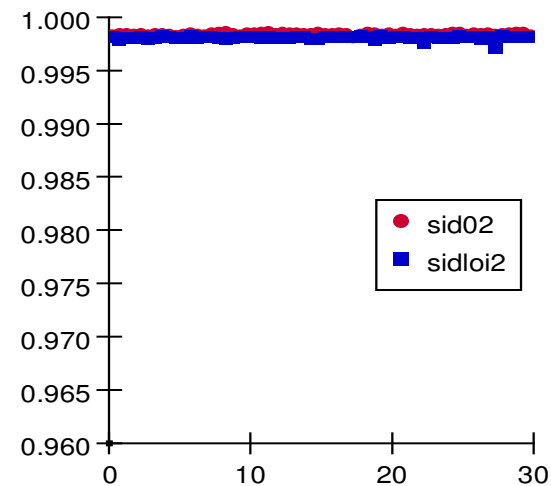
### Ecal Endcap: 1 GeV photons



### 10 GeV photons

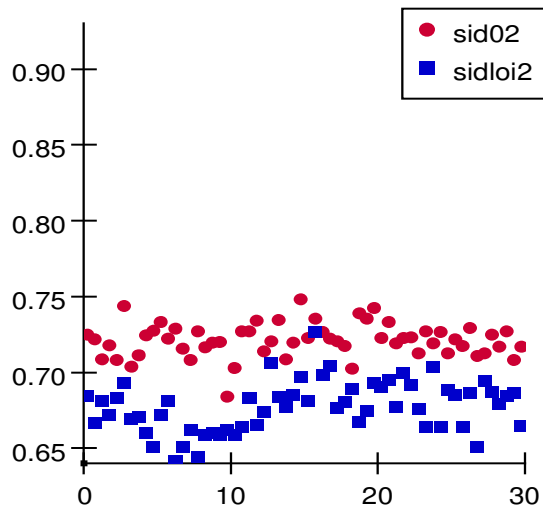


### 100 GeV photons

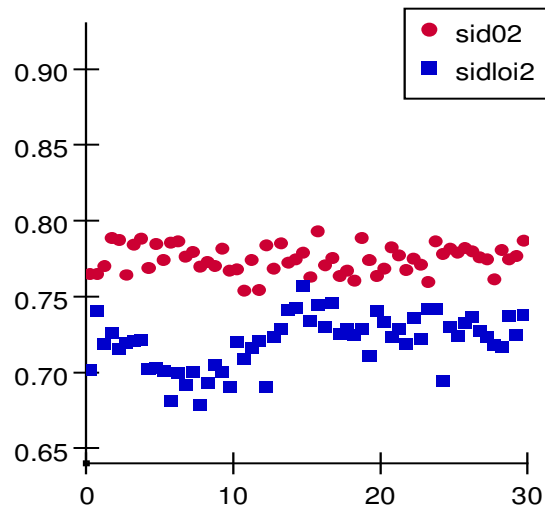


# DT clusters: $\langle \text{efficiency} \rangle$ vs $\phi$ (deg)

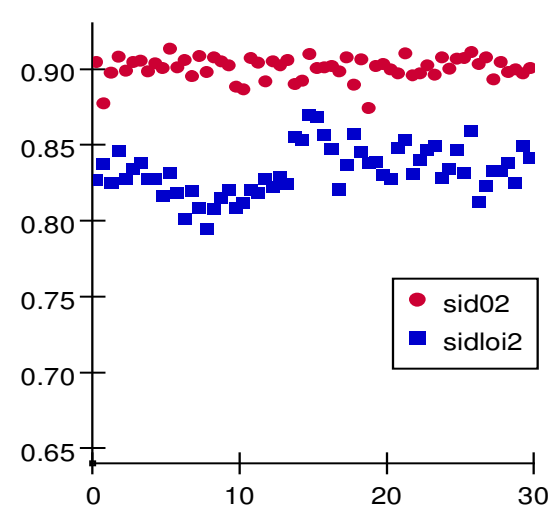
### Ecal Barrel: 2 GeV K0Ls



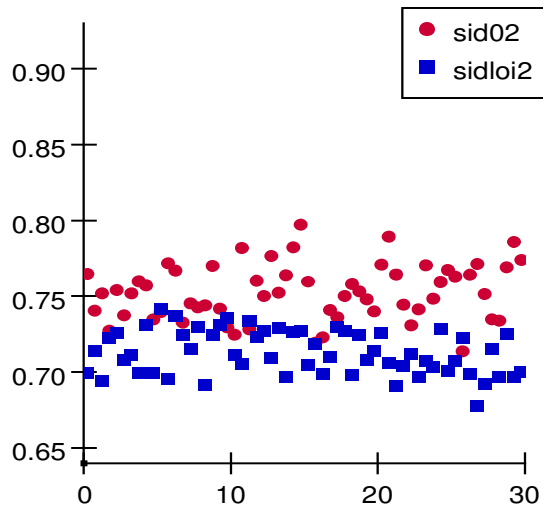
### 10 GeV K0Ls



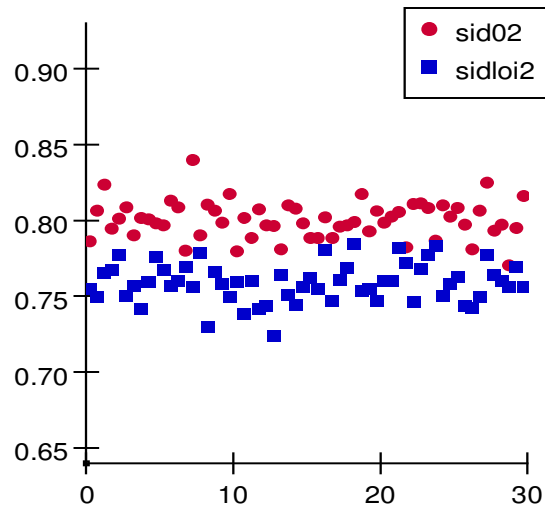
### 20 GeV K0Ls



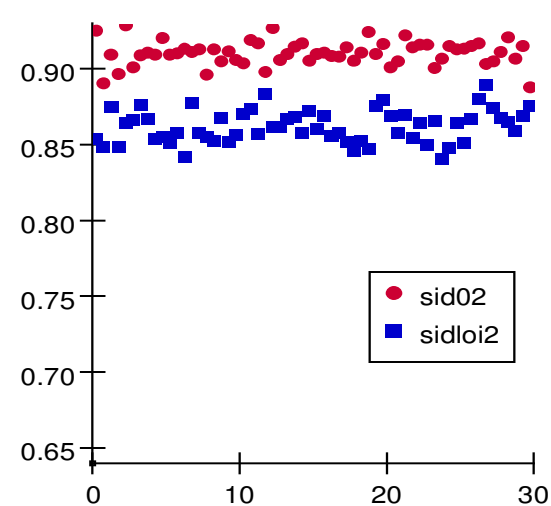
### Ecal Endcap: 2 GeV K0Ls



### 10 GeV K0Ls



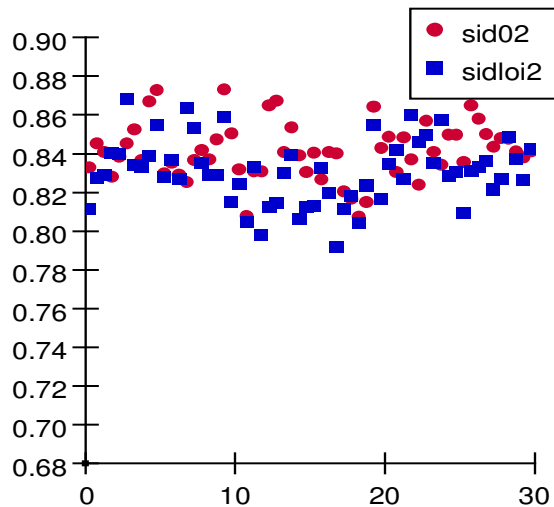
### 20 GeV K0Ls



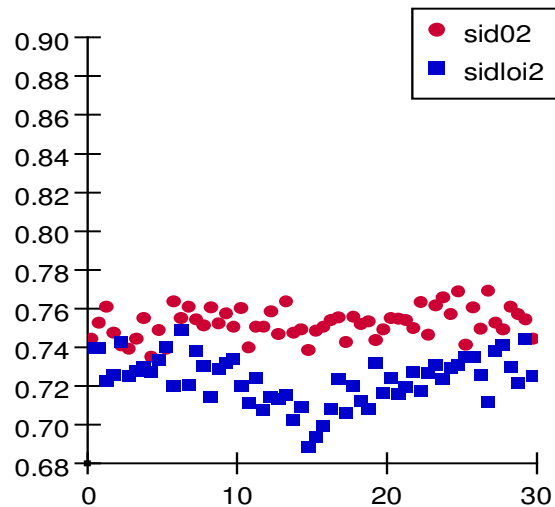


# DT clusters: $\langle \text{efficiency} \rangle$ vs $\phi$ (deg)

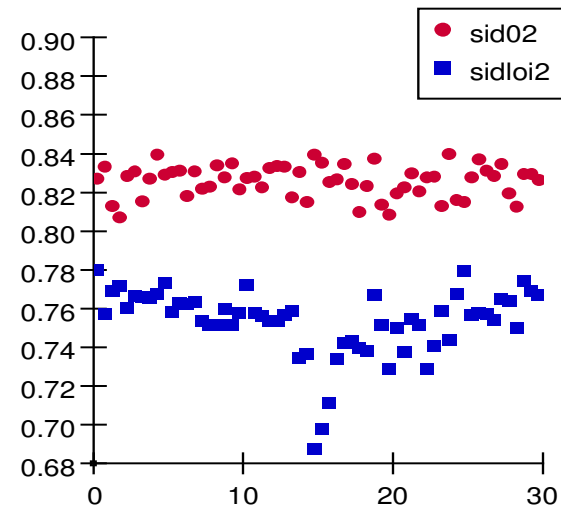
### Hcal Barrel: 2 GeV K0Ls



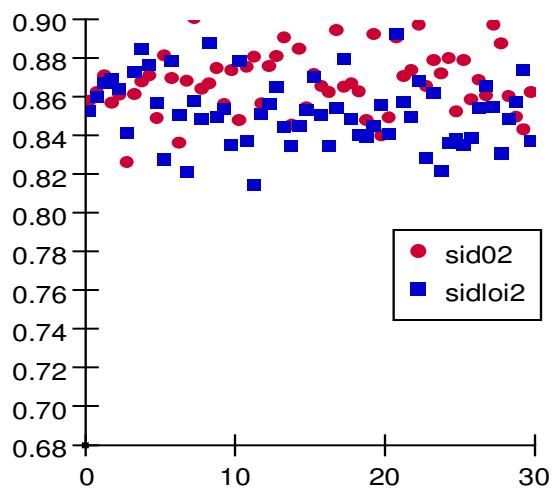
### 10 GeV K0Ls



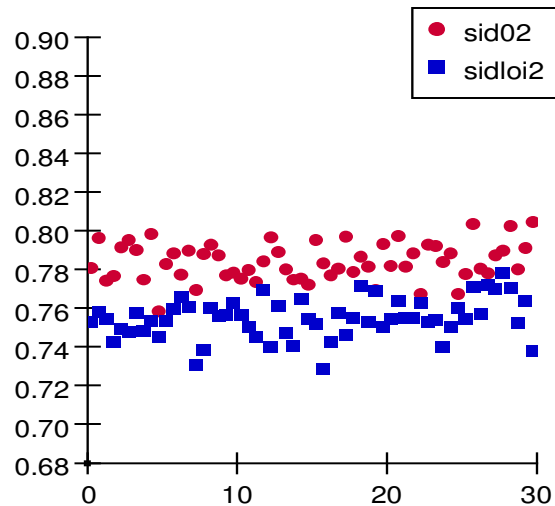
### 20 GeV K0Ls



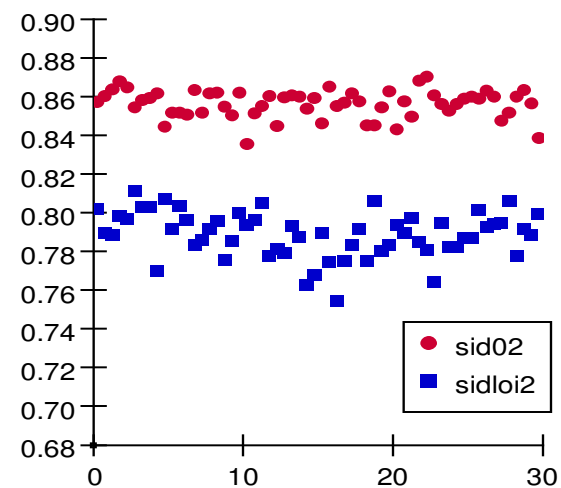
### Hcal Endcap: 2 GeV K0Ls



### 10 GeV K0Ls



### 20 GeV K0Ls



# Conclusions

- Overall efficiency lower than for sid02.  
Geometry? Modeling?
- Known difference in neighboring should be fixed, but expect small effect.
- DT density calculation should be checked.  
(Possible problem near borders)
- Border problems visible, but generally smaller than overall drop.