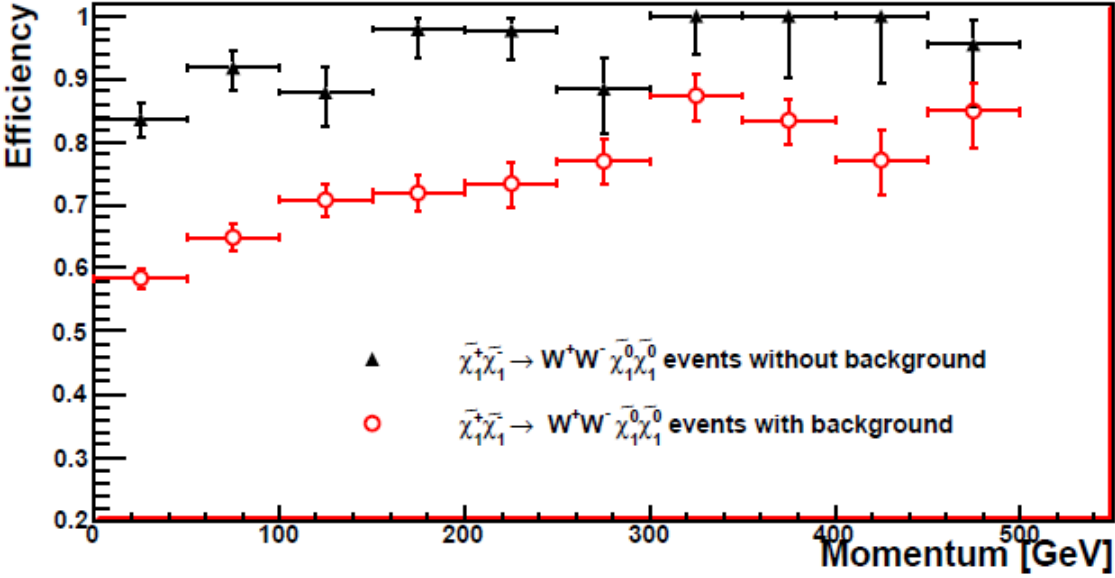
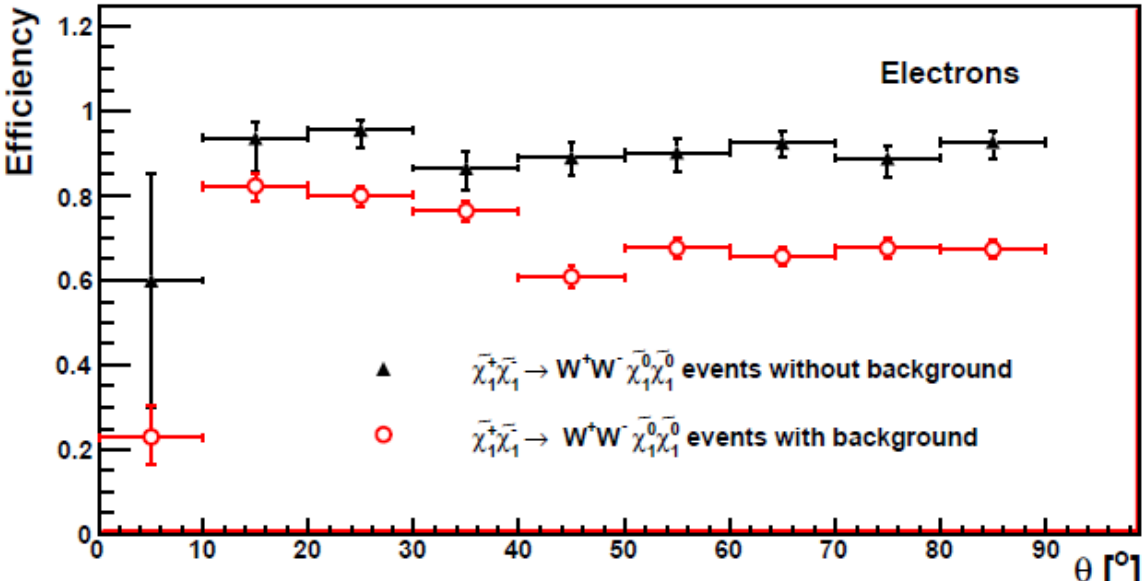


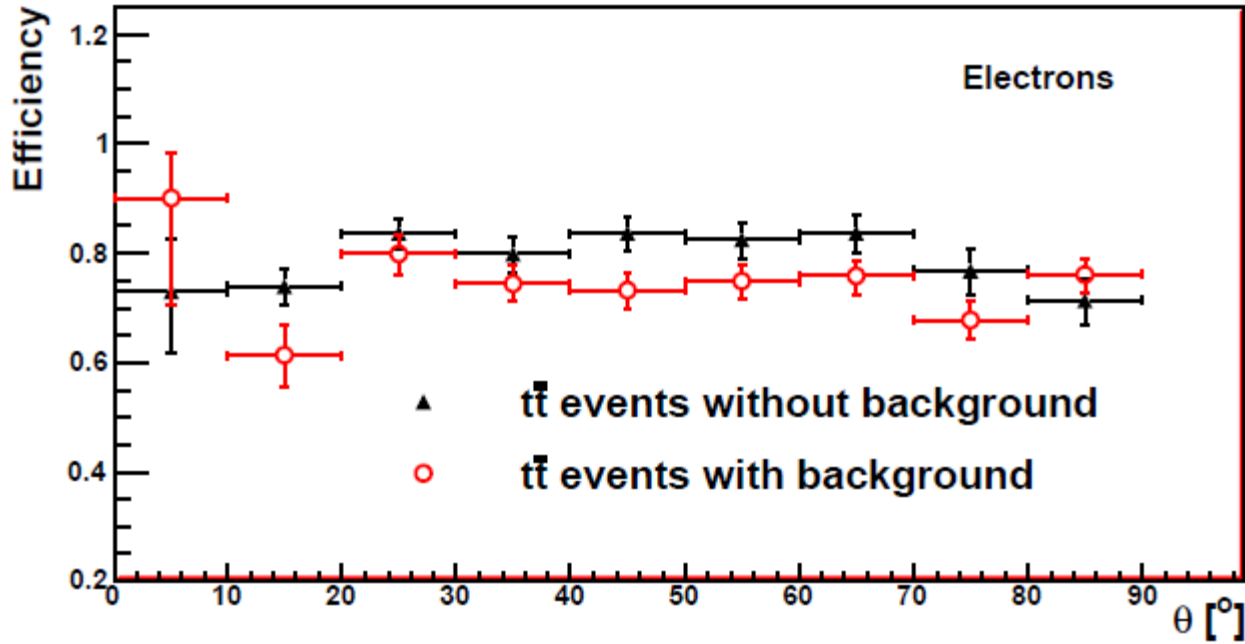
SiD Electron ID

In these slides summary of discussion between
J.J.Blaising, C.Grefe, J.Marshall, J. McCormick,
J.Nardulli, J. Strube, M.Thomson

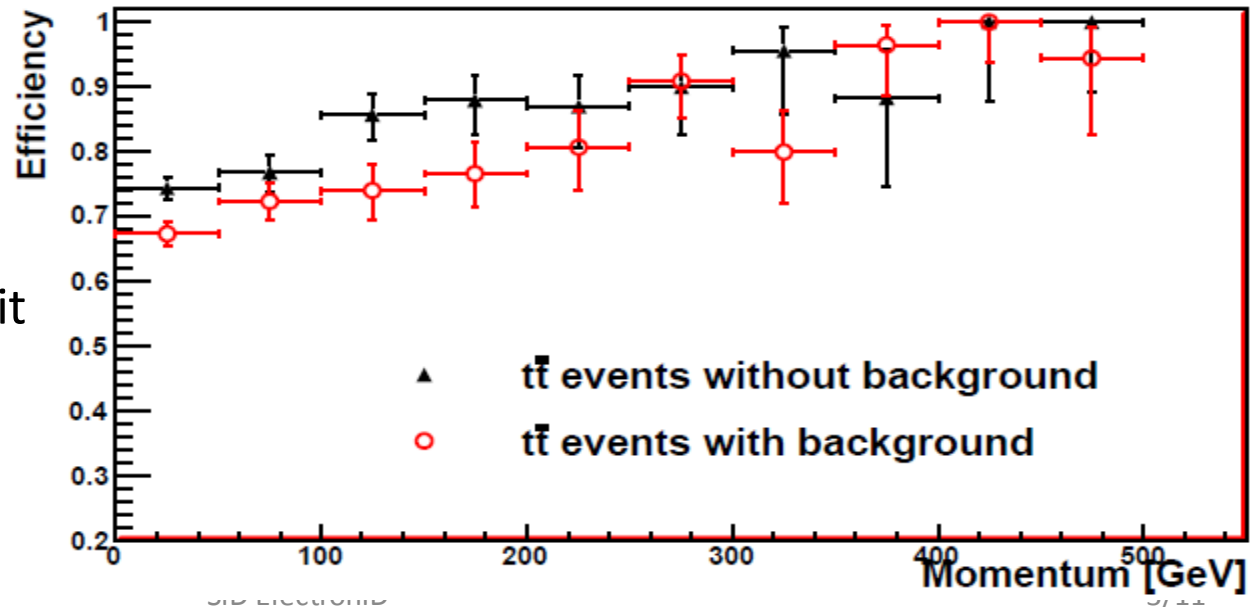
Where we first saw the problem: chargino events



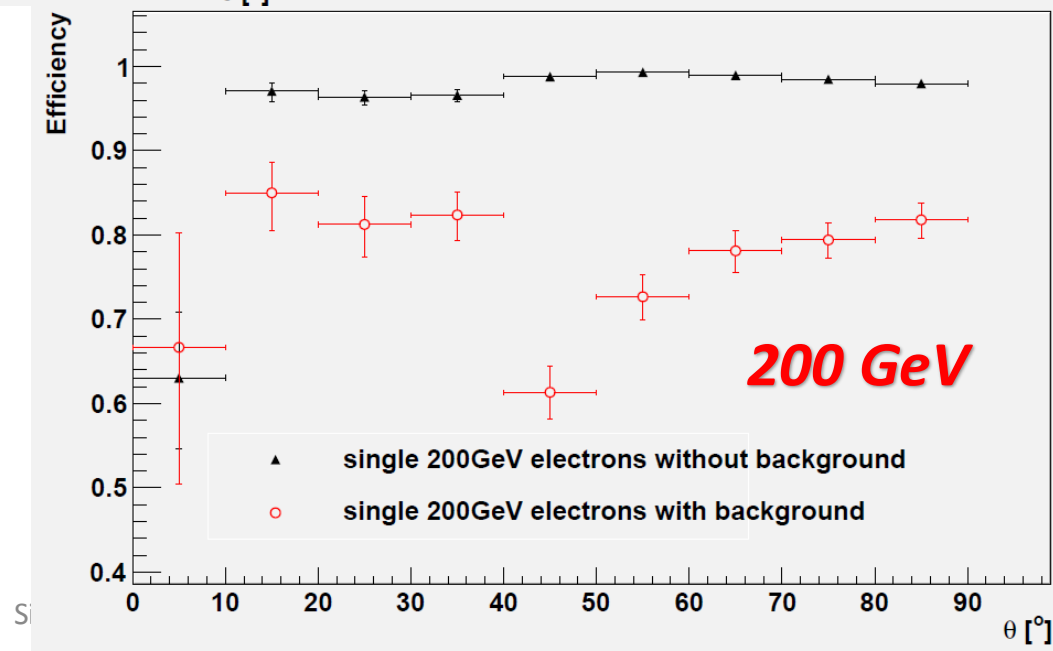
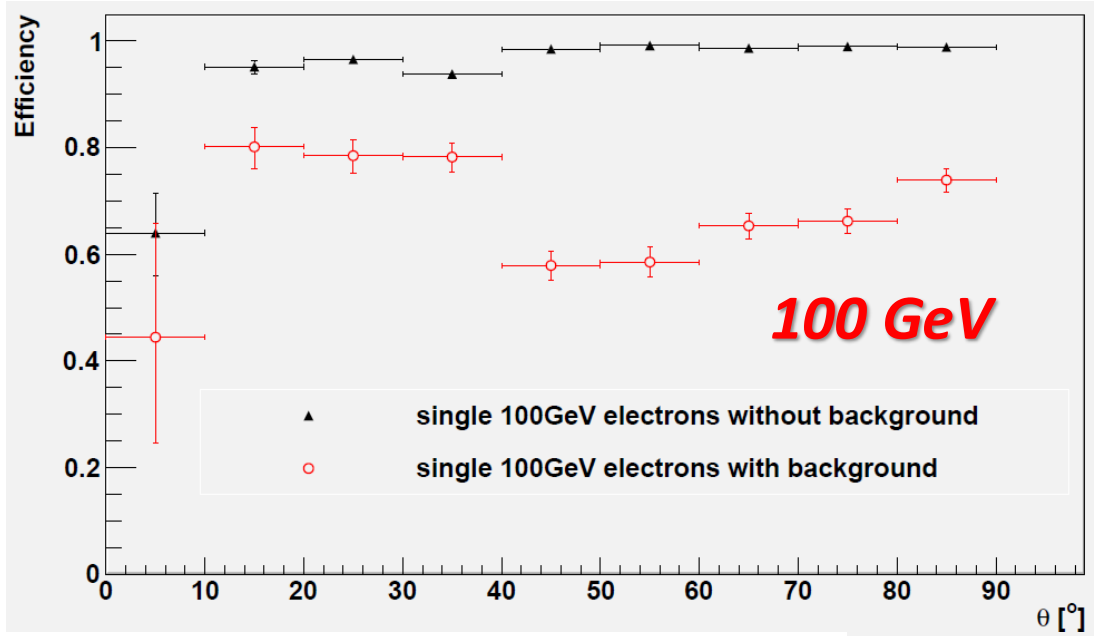
How does it look in ILD: $t\bar{t}$ events



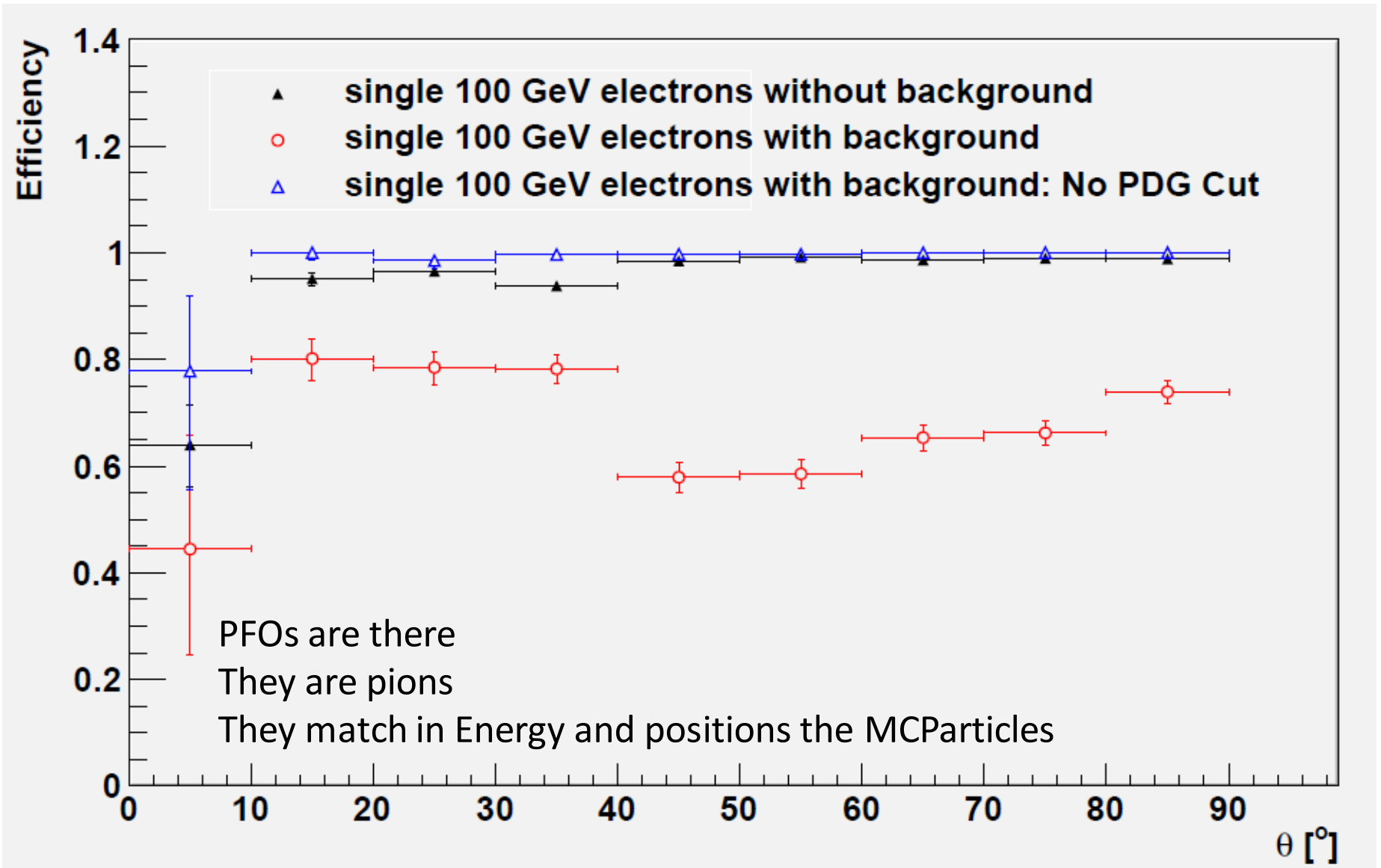
Not fantastic, but sort of expected, we can live with it



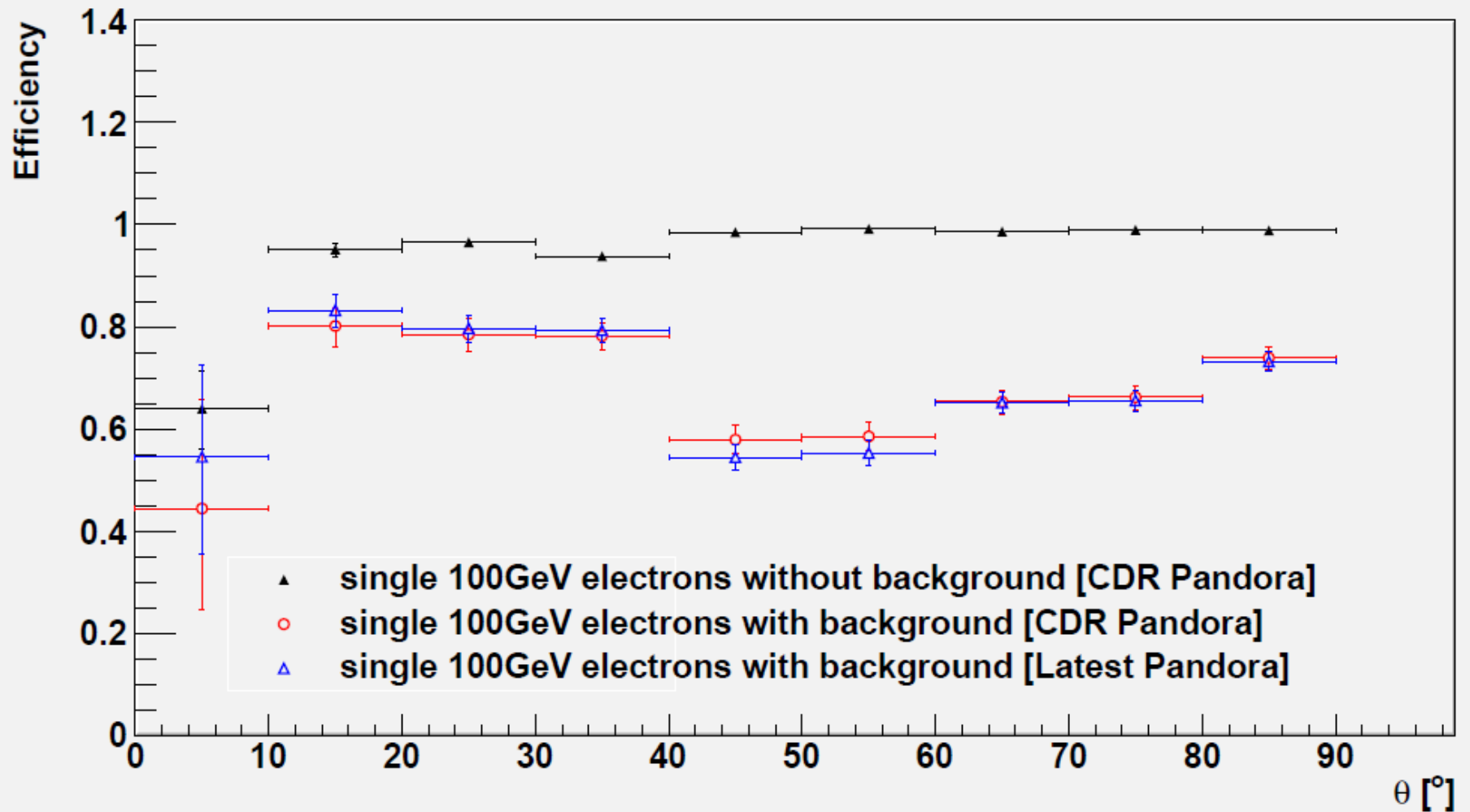
Get back to SiD particle gun and see what we have



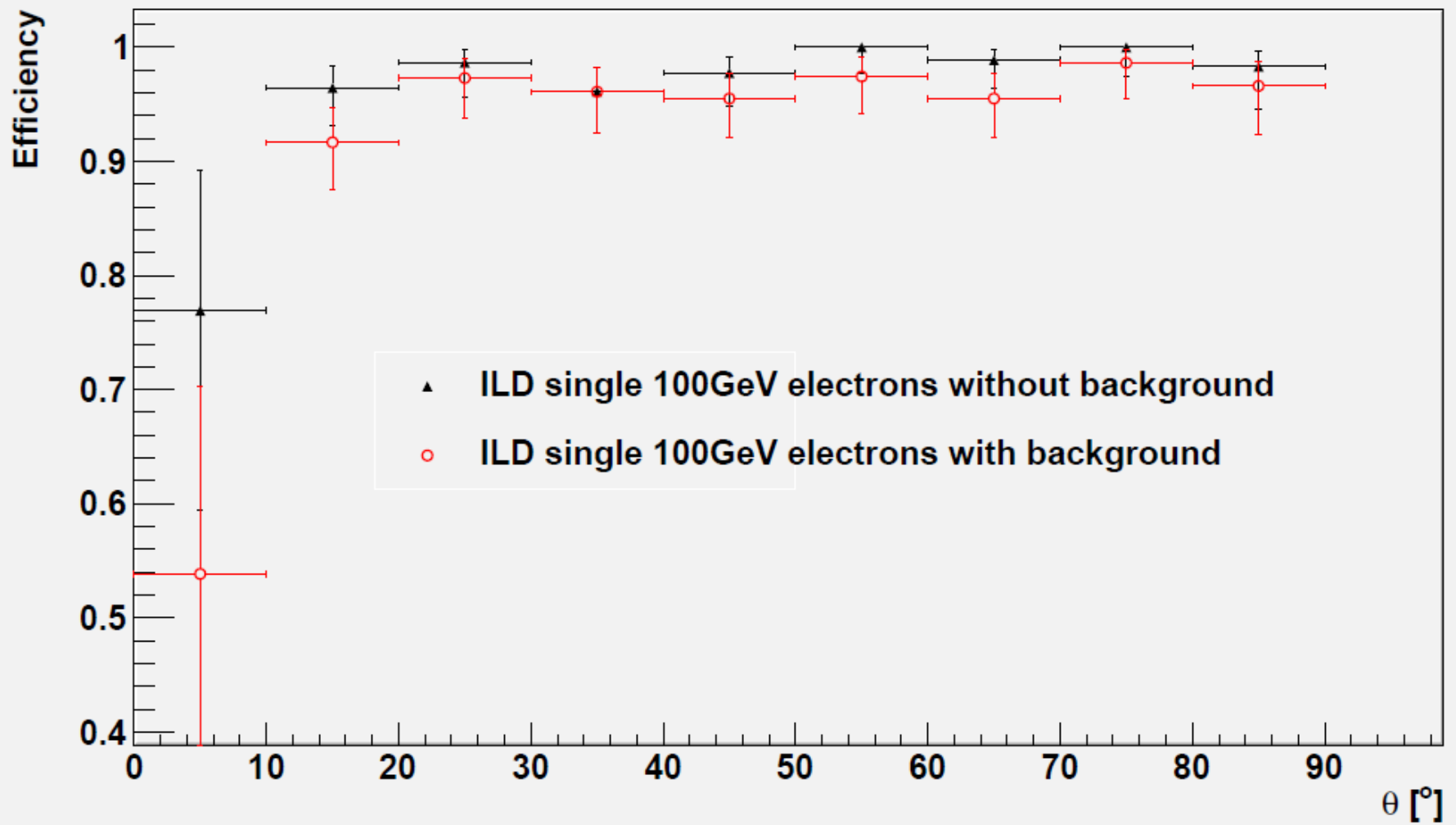
Some debugging: removing PDG cut



What if we move to the latest Pandora ?



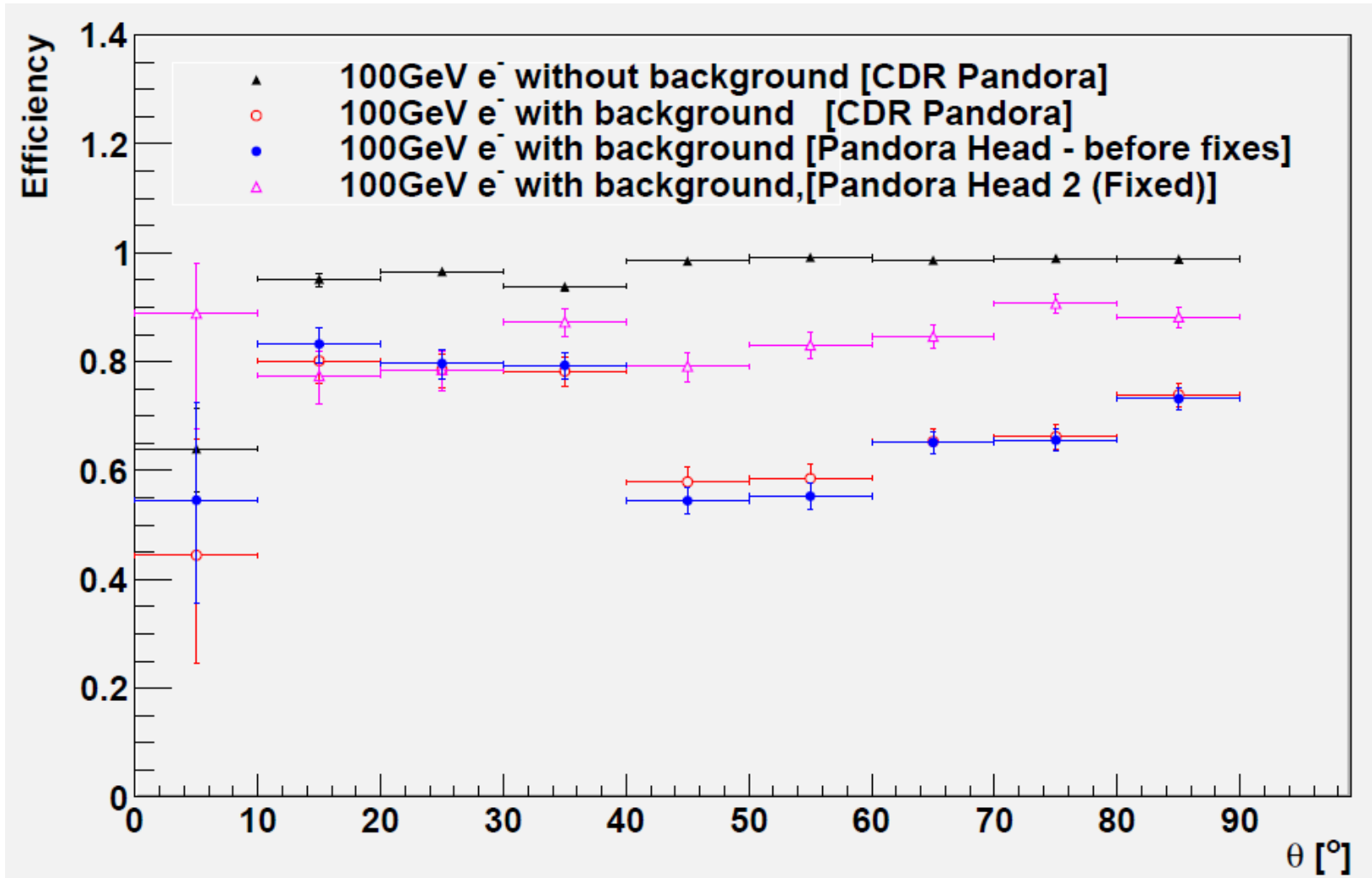
What about ILD ?



To the origin of the problem

- Problem in “SoftClusterMerging” Algorithm
- This algorithm attempts to remove small, low energy clusters and merge them with nearby parent cluster
- With background more soft-clusters.
- If these clusters are merged the topology of the electron cluster is altered and it fails the electromagnetic shower-id
- *In particular the modified clusters fail the cuts on the radial direction cosine of a linear fit to the cluster.*
- Solution attempted by JM:
 - modify ClusterFit classes used by Pandora in order to try to make these fit results more robust to the addition of small clusters
 - Reconfiguration of “SoftClusterMerging” algorithm

Where do we stand after these modifications



Next steps

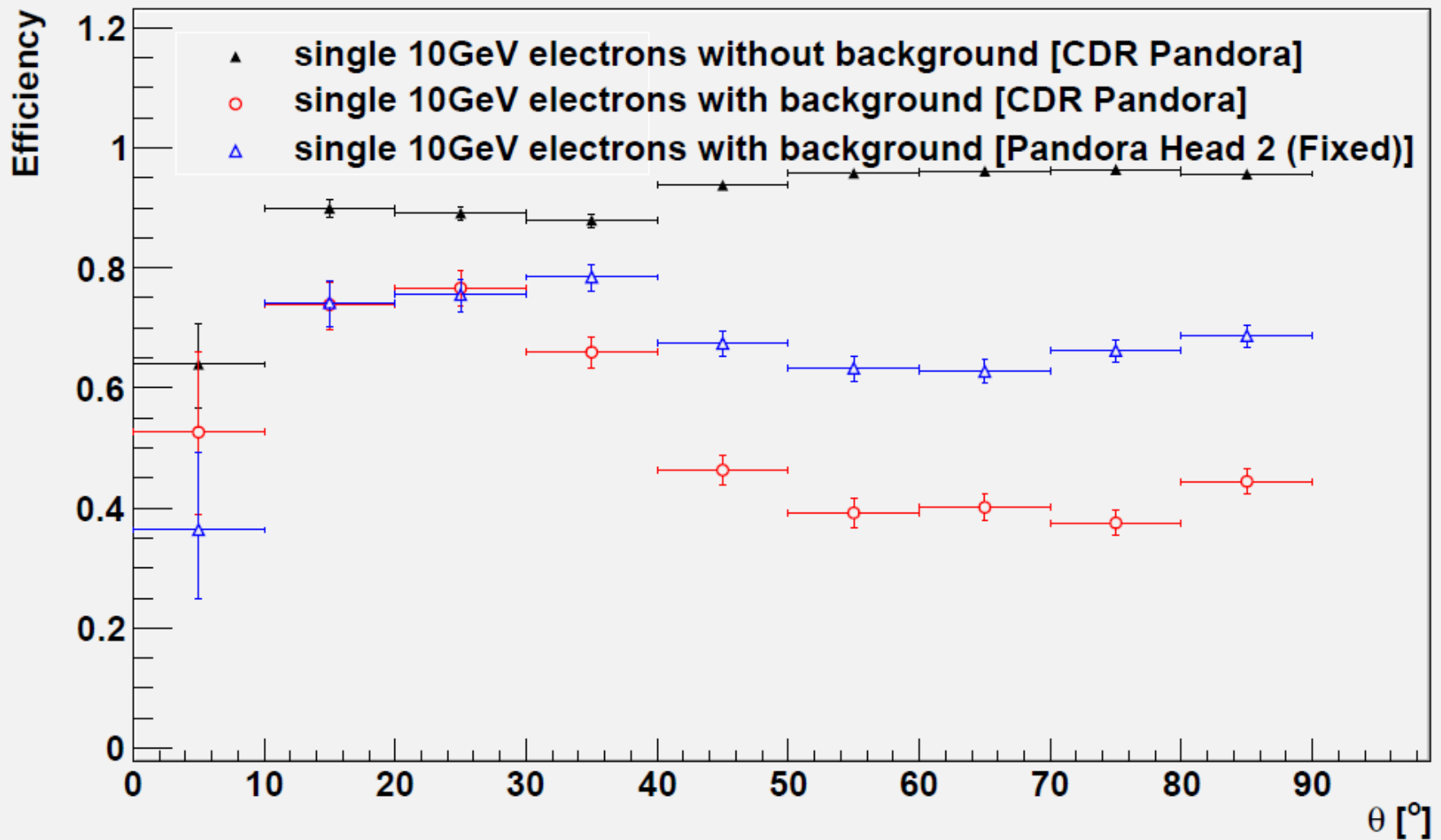
- Things have improved and
- Now we know where and how things go wrong
- The clusters still seem to fail the radial direction cosine cut
- Possible way forwards
 - The cut can be tuned but is a dangerous cut to play with, as it will also affect the jet energy reconstruction and the photon-ID
 - Removing the SoftClusterMerging algorithm. Efficiency should be high, but we are going to have other problems

Partially unrelated: LCDNote 2011-012

- [LCDNote 2011-012](#) discusses the PID performance for particles in jets in ILD and SiD
- I do not think we should change the results in the note, as the note has to describe the performance of particle-ID for the CDR
- We need to understand the inefficiency and explain it
- If we want to release the note before the CDR review, we should just add an explanation for the inefficiency and mention that this is under investigation and is fixed in the next version of Pandora

Backup

Where do we stand after these modifications



Where do we stand after these modifications

