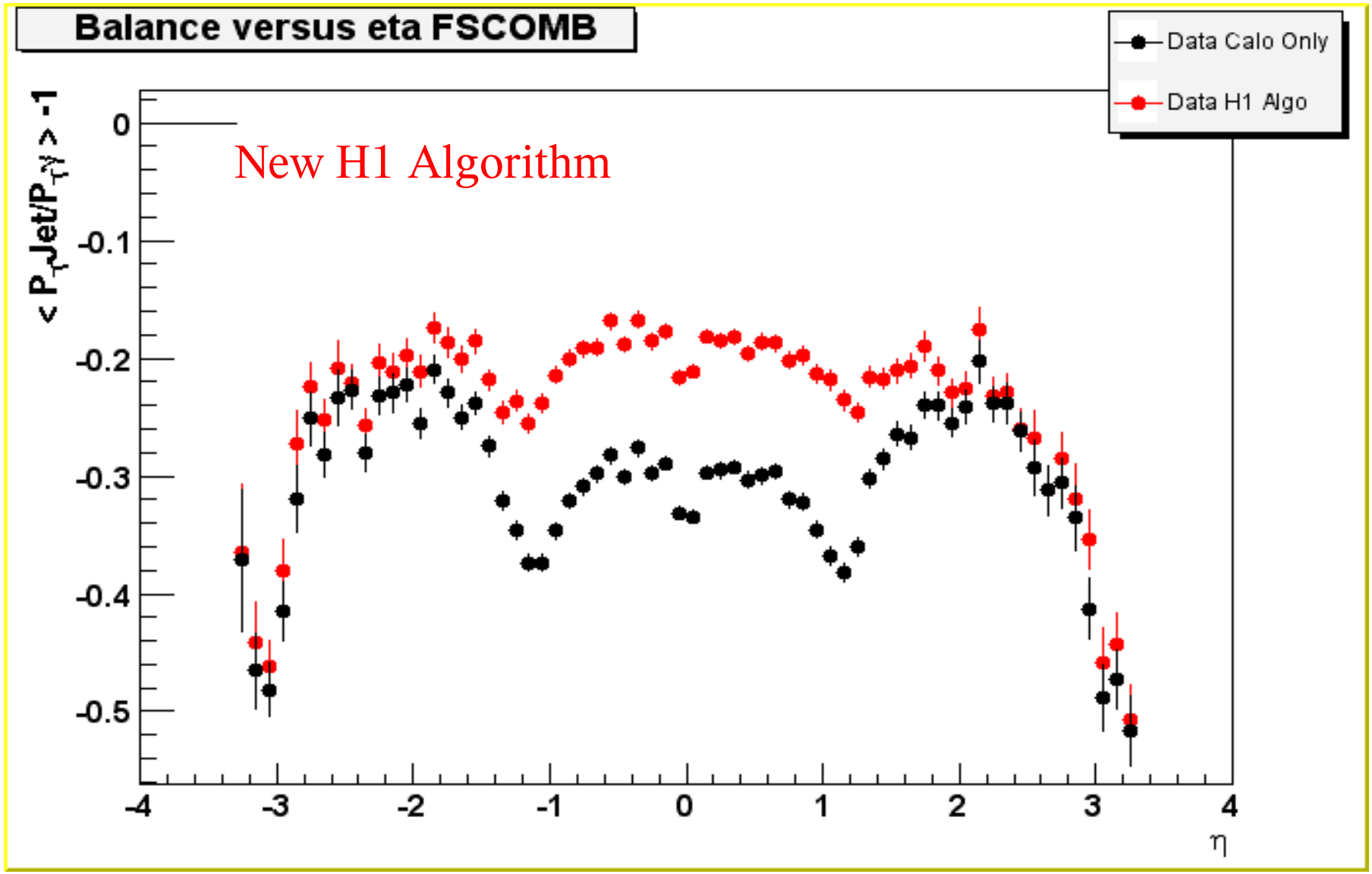
Resolution Studies of Calo Alone +H1 Algorithms

A. Mehta
Liverpool University

Improved H1 Algorithm

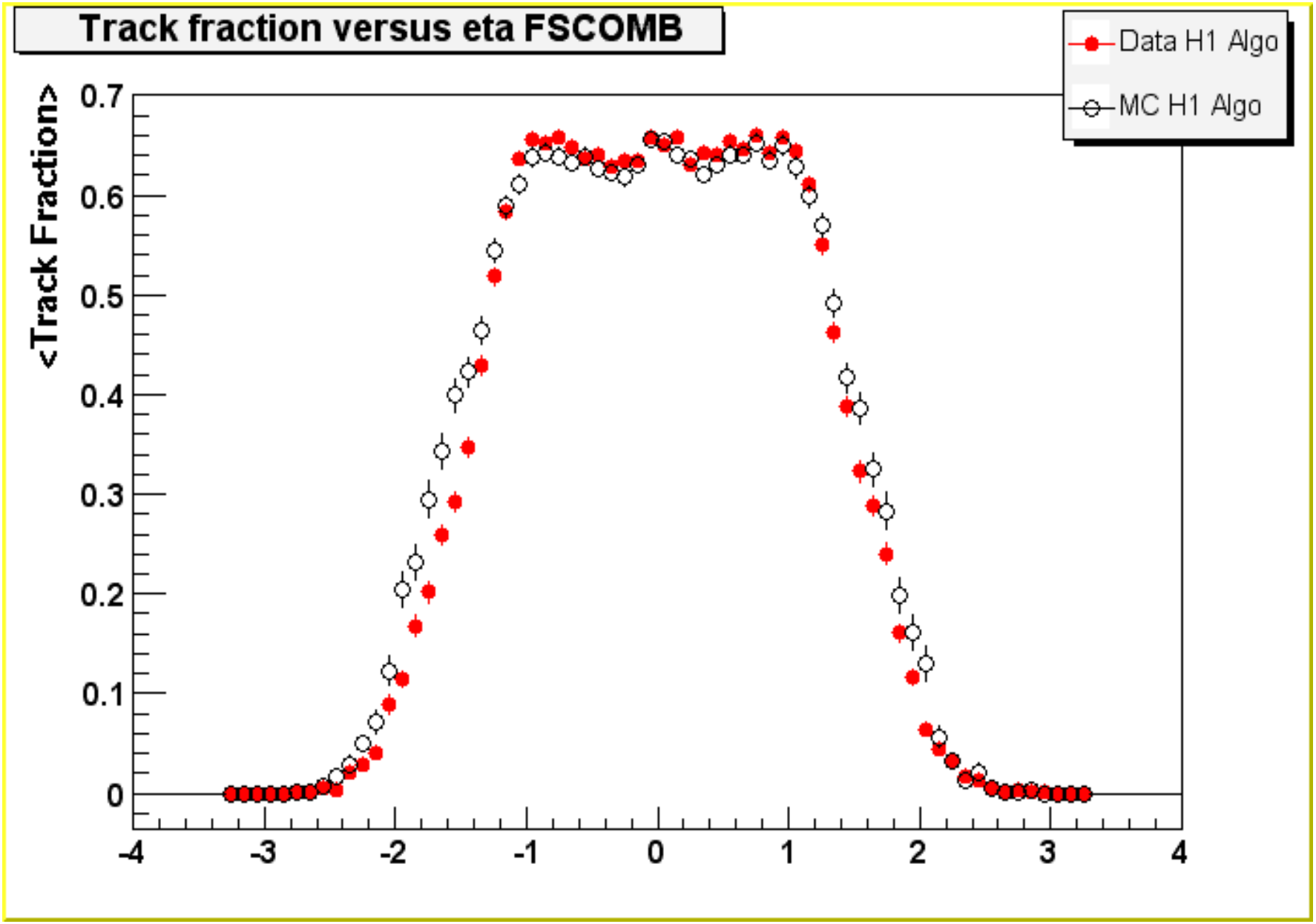
- Keep all good quality tracks
- Extrapolate tracks to calo
- Search for energy in a box ($\Delta\eta \pm 0.1$, $\Delta\phi \pm 0.2$) about track or nearest tower
- Sort towers within box wrt $\eta\phi$ distance to track
- Loop over towers :
  - Kill successive towers so that $\sum$Ekilled<=Etrack
  - If $\sum$Ecalo>Etrack rescale last tower so that $\sum$Ekilled=Etrack

- Now takes into account energy in other towers
- With perfect calo there is no double counting
- Energy of jets with high particle density will tend towards calo energy

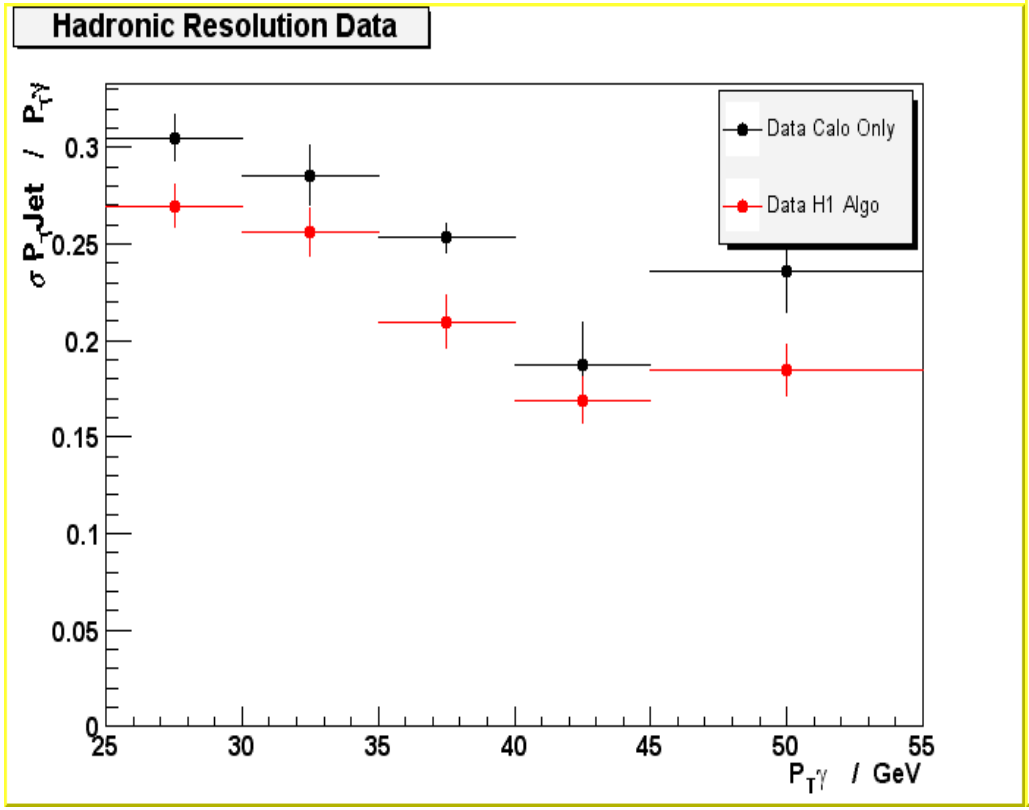


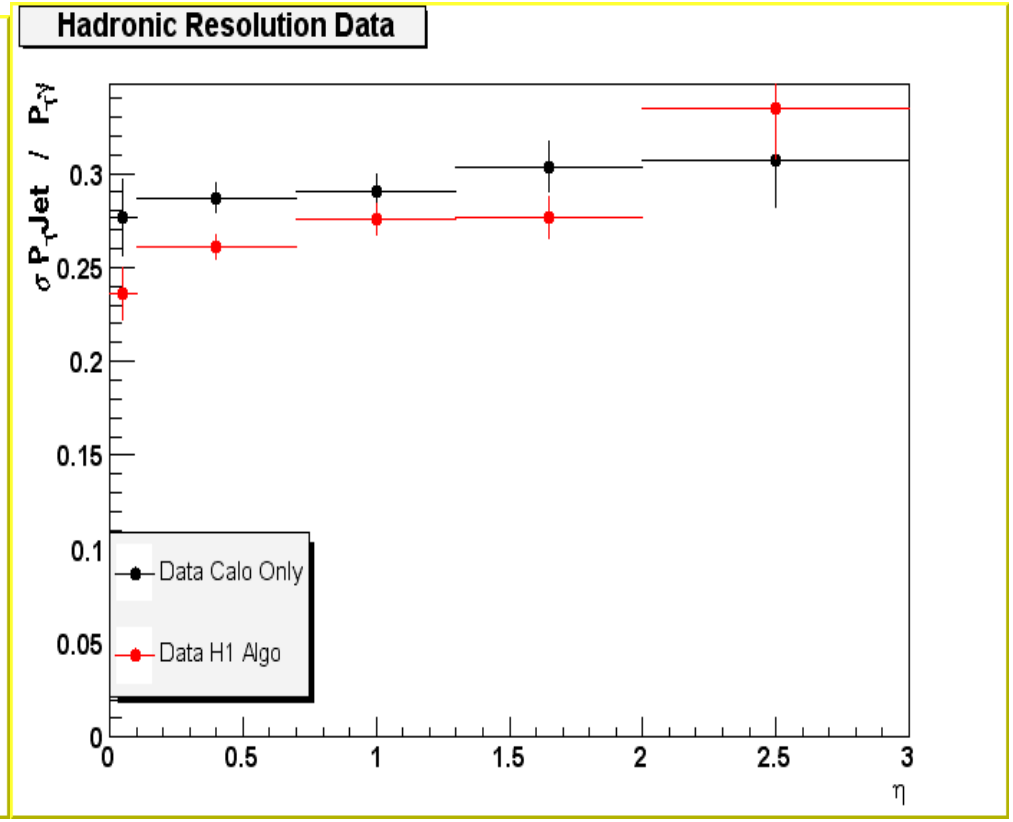
Without double counting jet energy scale improves by 10%

Fraction of jet energy carried by tracks

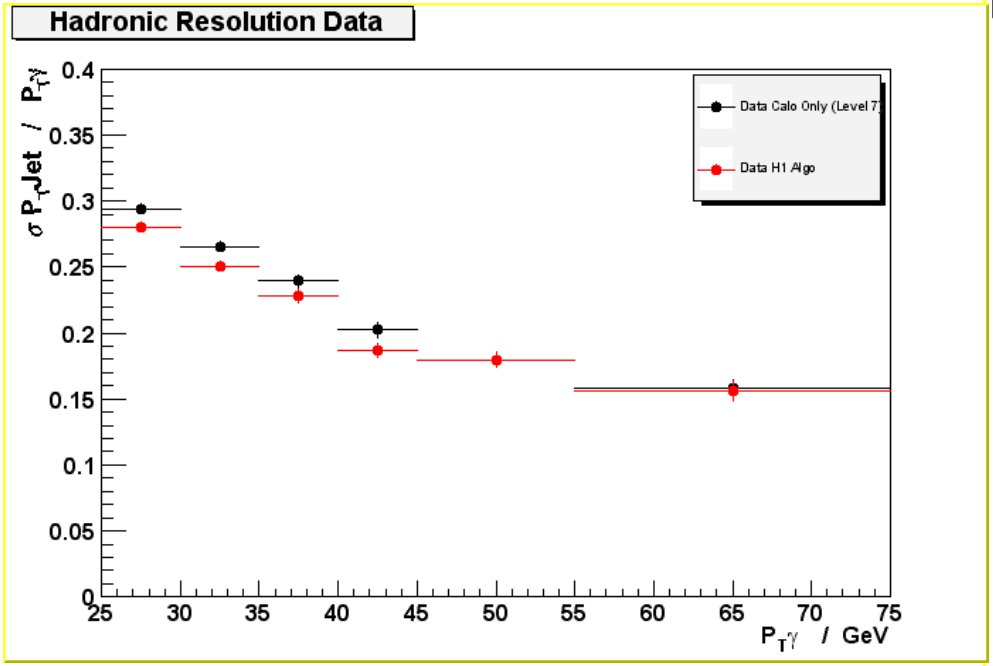


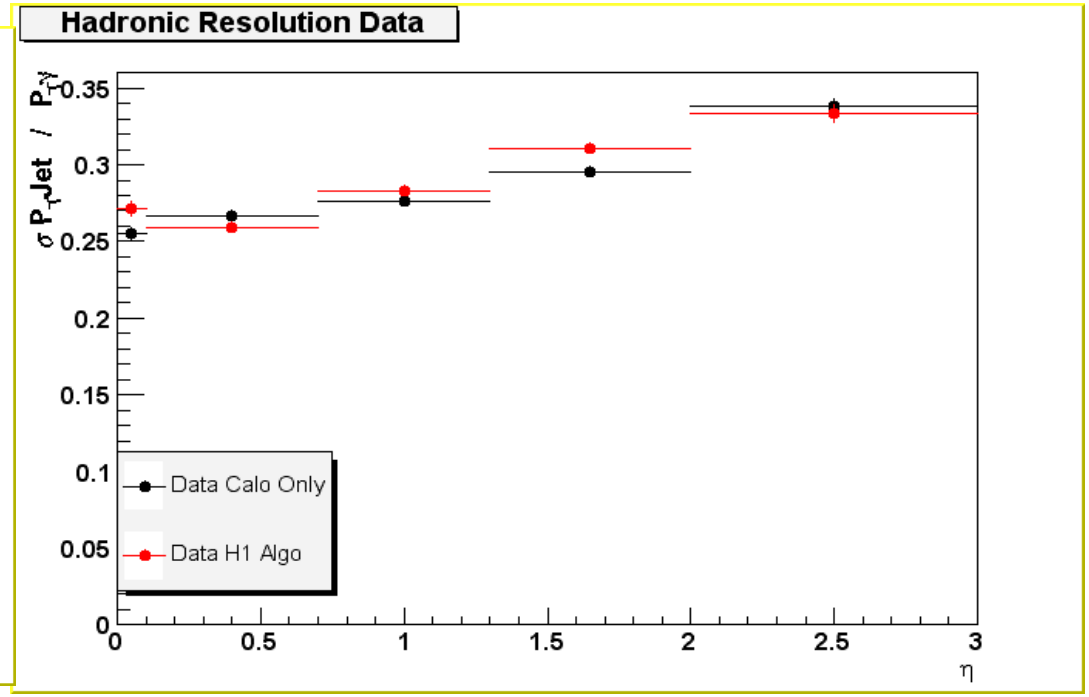
Comparison to calo only (no jet corrections applied)





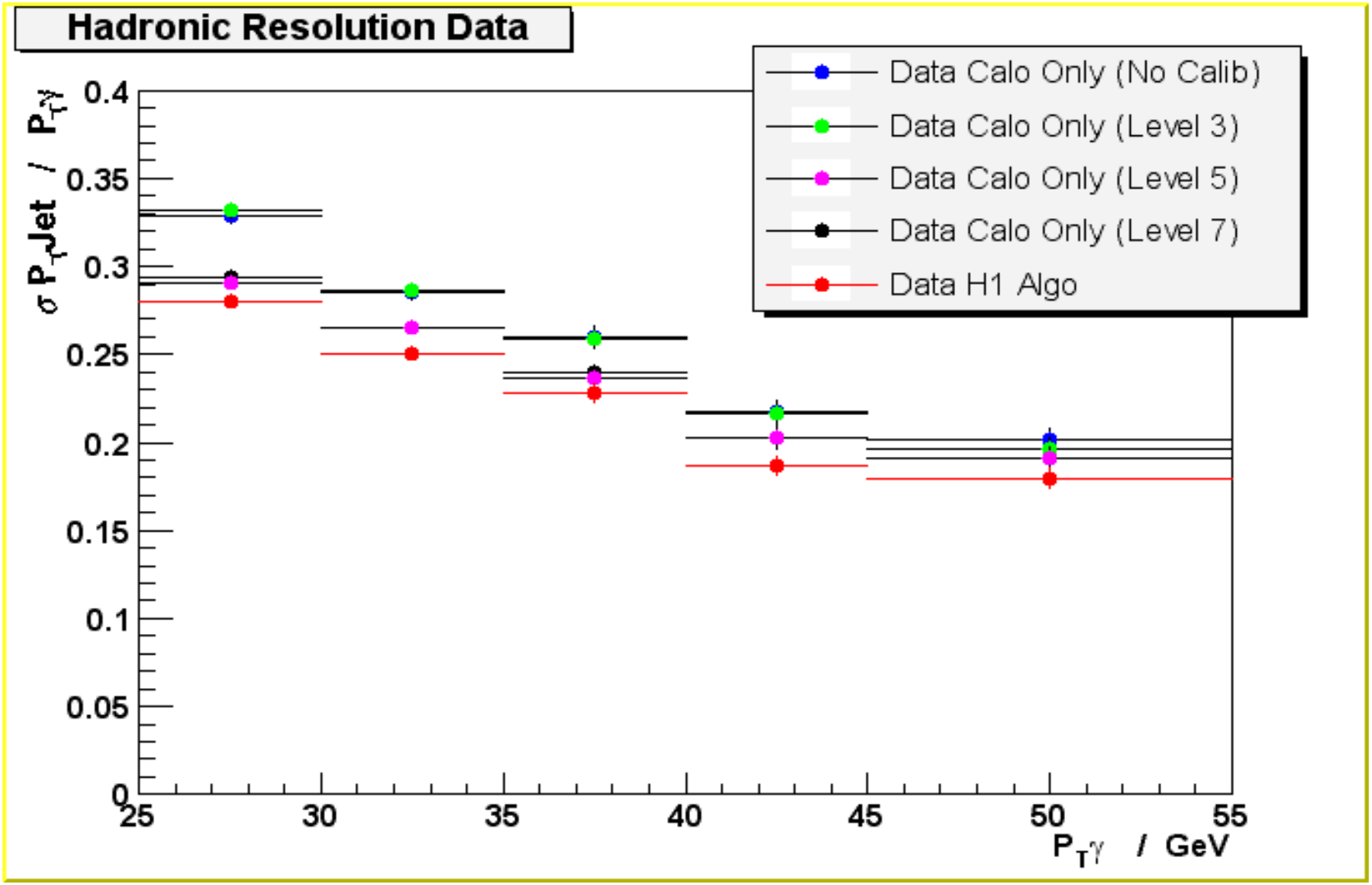
Comparison to calo only (with jet corrections applied)





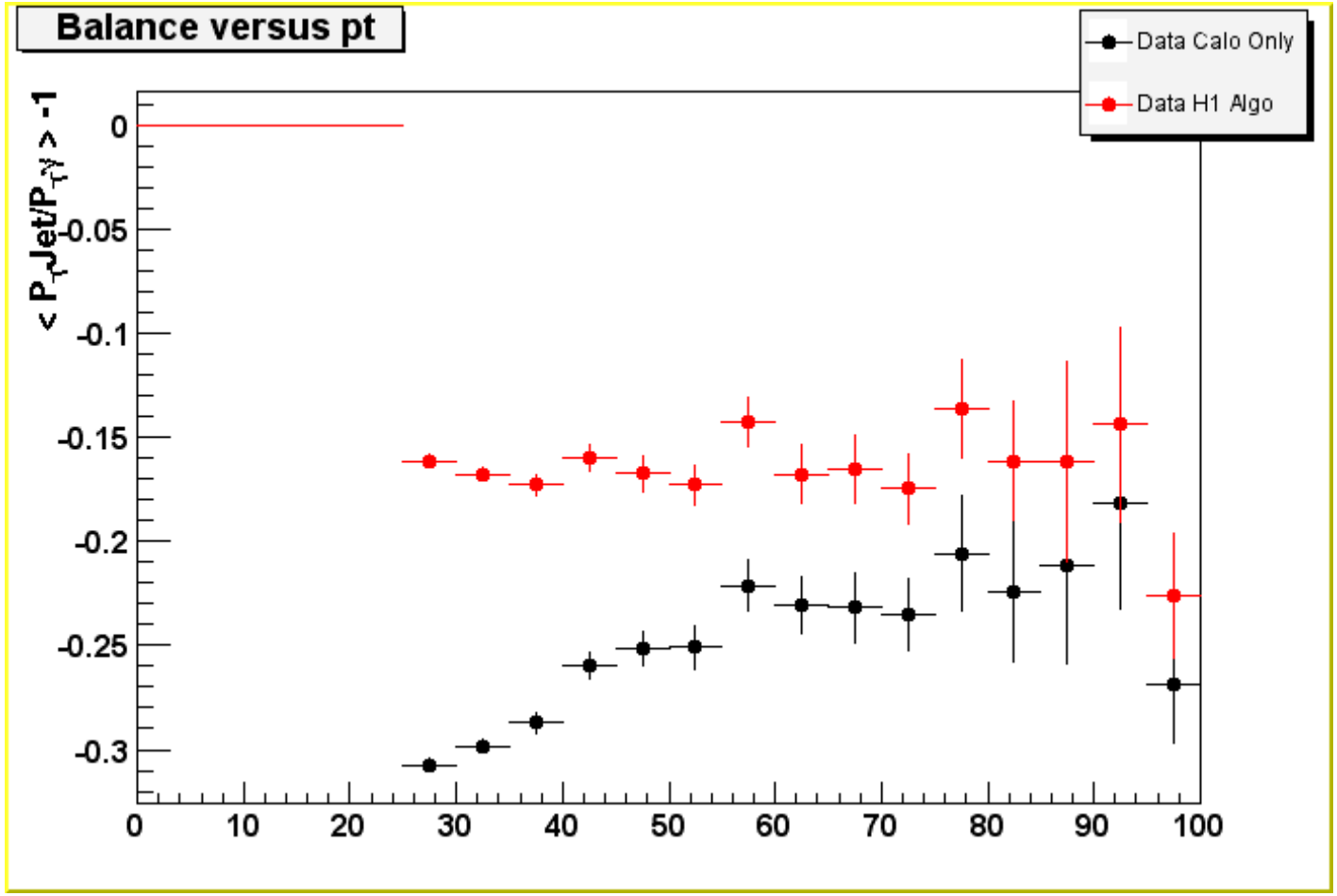
Modest improvement after corrections

Why? Look at jet corrections one by one



Significant improvement in resolution after level 5

Level 5 corrections are Pt dependent



By correcting for Pt dependence we get an improvement in resolution of calo only. We should not expect an improvement for H1 Algo since the Pt dependence is much improved already

Summary

- H1 algorithm shows modest improvement in resolution compared to calo only after jet corrections
- Calo only resolution improves with pt dependent correction
- H1 algorithm unlikely to improve with any corrections