

Lawrence Bronk
MIT

**DETECTOR OPTIMIZATION:
A NEWBIE'S JOURNEY INTO
SLIC AND THE ORG.LCSIM
FRAMEWORK**

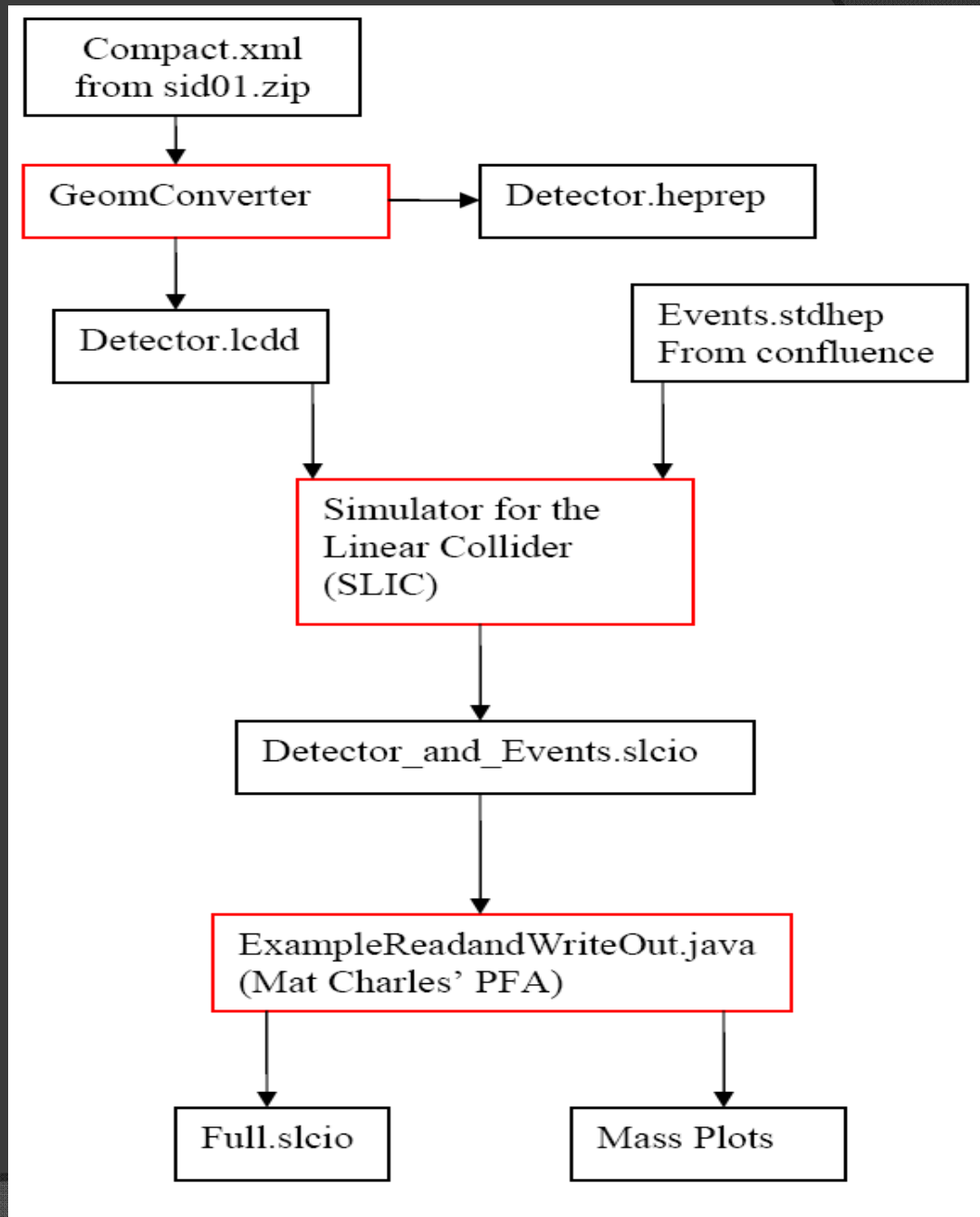
Outline

1. Purpose
2. Methods
3. Results
4. Conclusion

Purpose

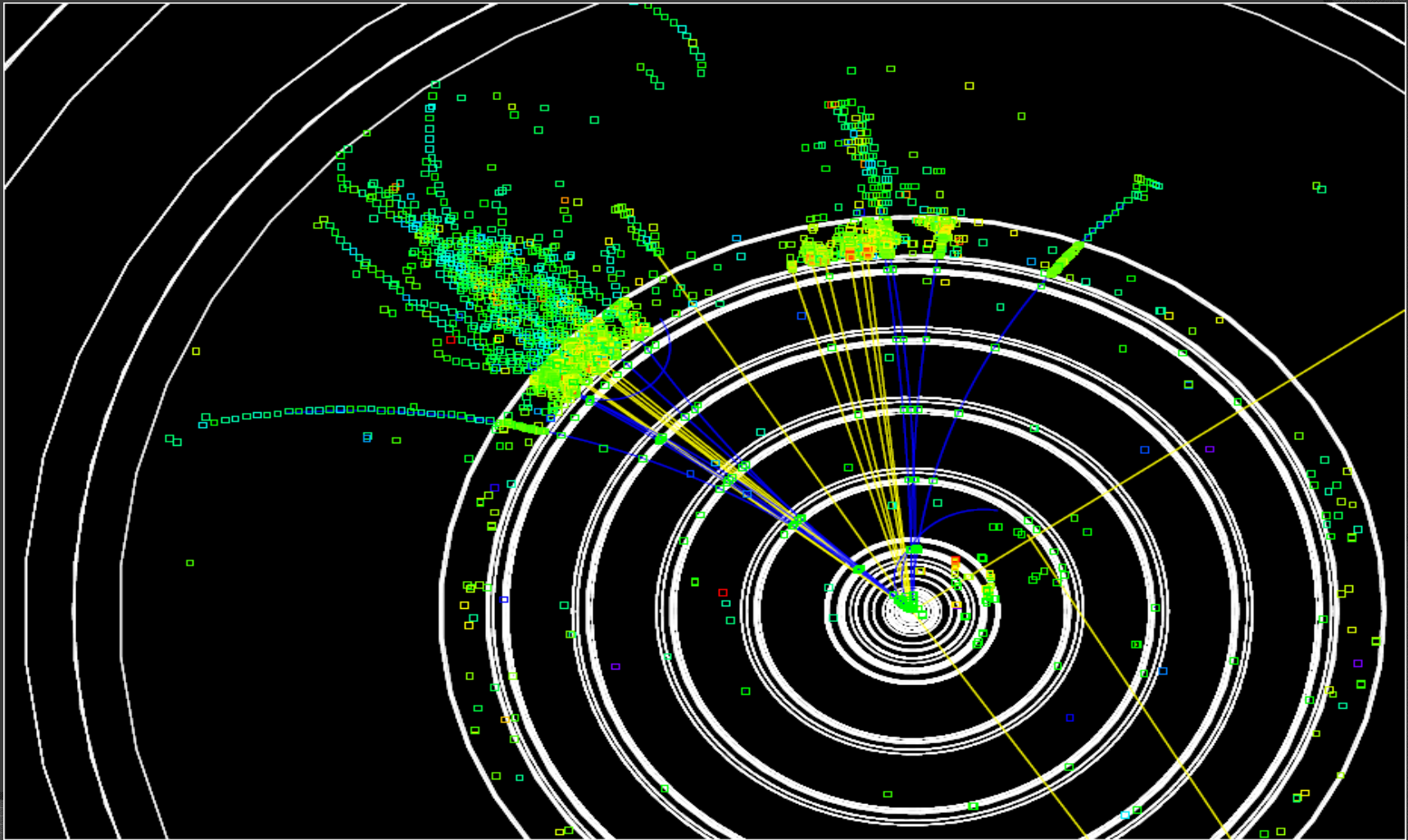
- ⦿ International Linear Collider & Search for New Physics
- ⦿ Senior Thesis (would like to graduate)

The Flow

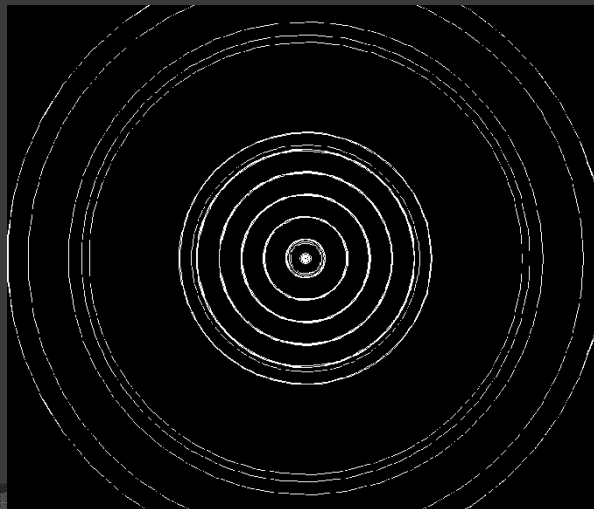
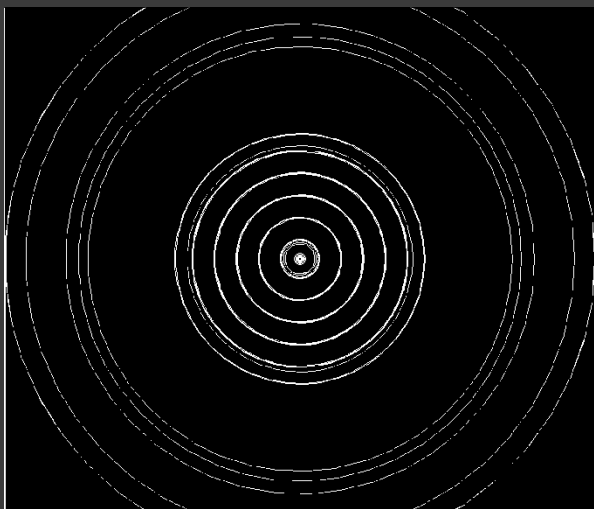
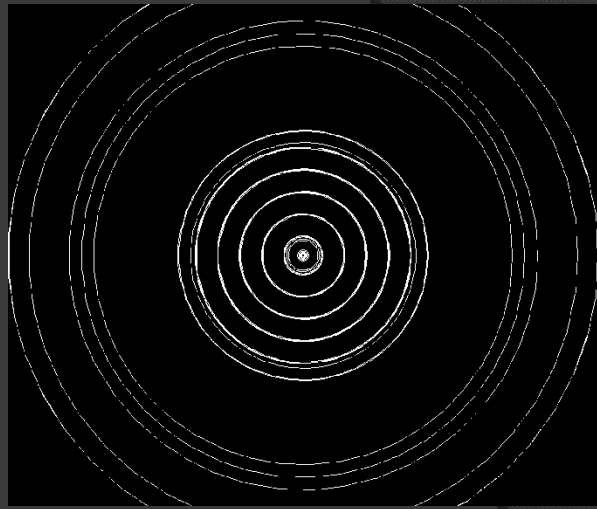
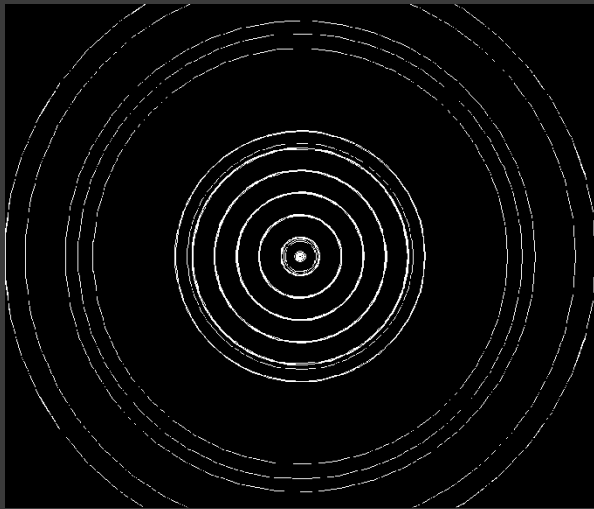
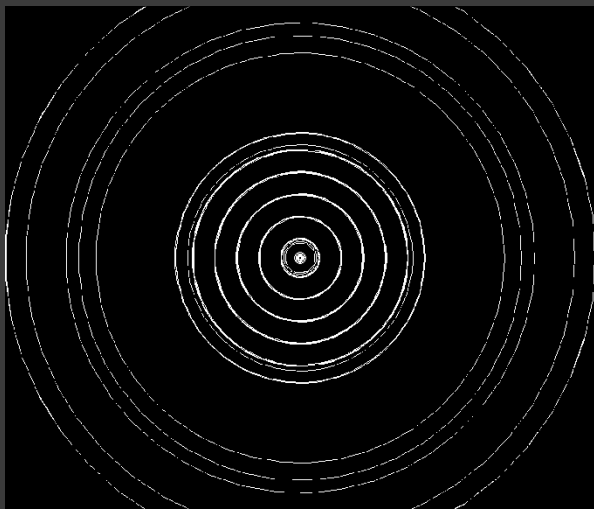


The Hadronic Calorimeter

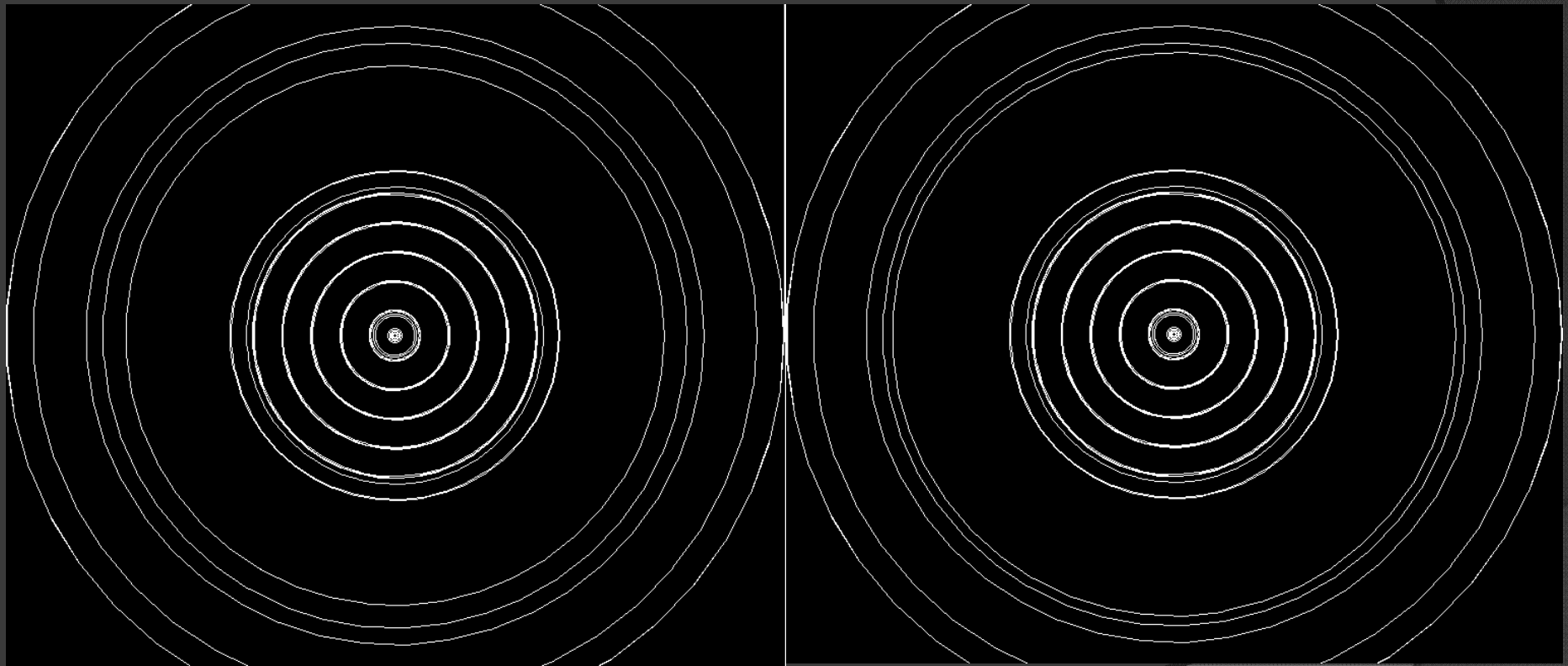
- Most difficult reconstruction
- Event of choice, the beloved $ZZ \rightarrow q\bar{q}, \nu\bar{\nu}$



Changing the HCAL



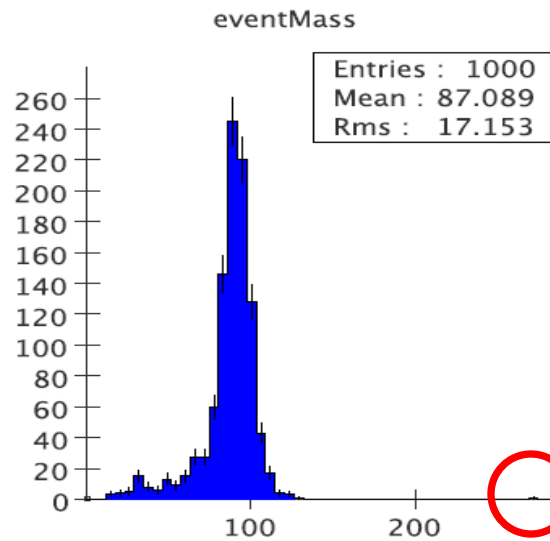
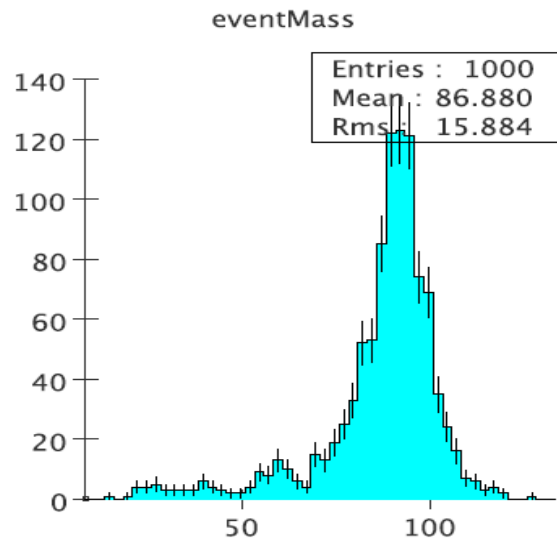
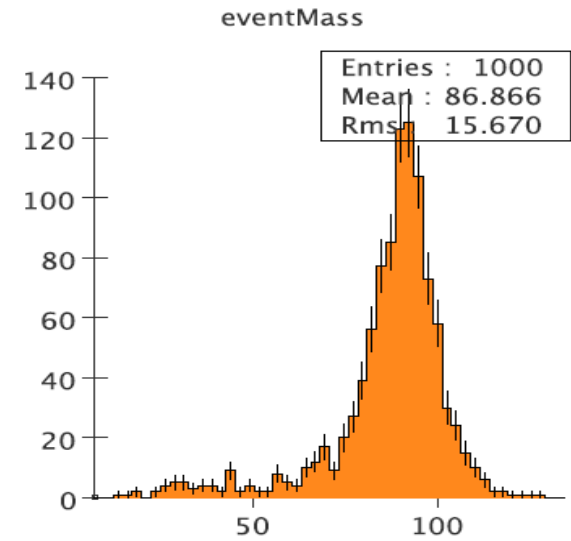
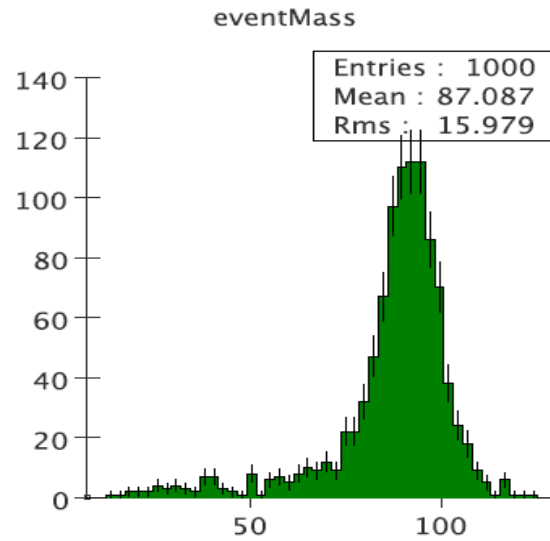
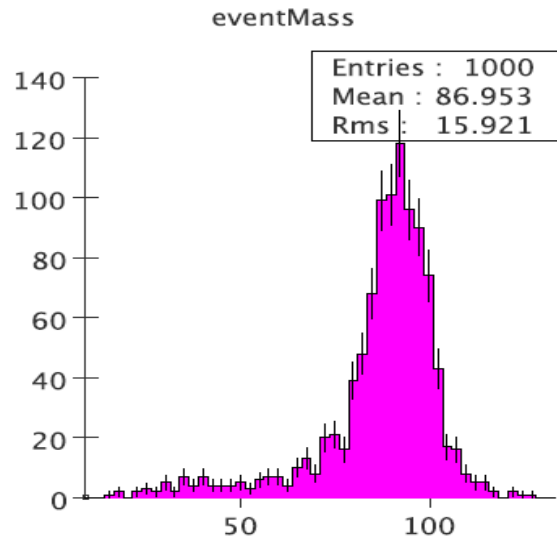
A Better Look



32 HCAL layers

36 HCAL layers

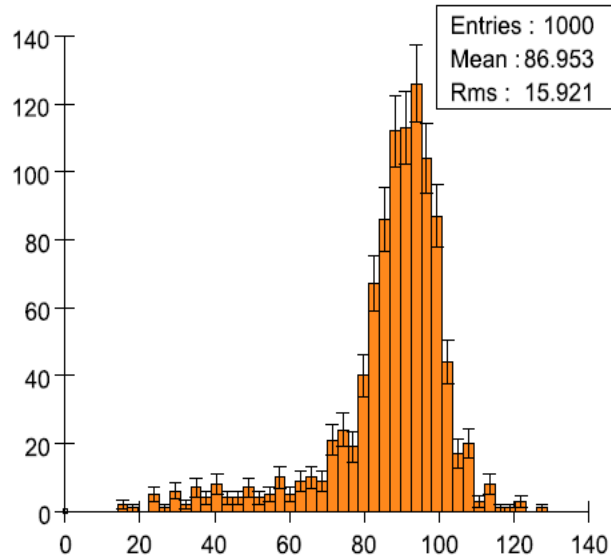
Reconstructed Mass



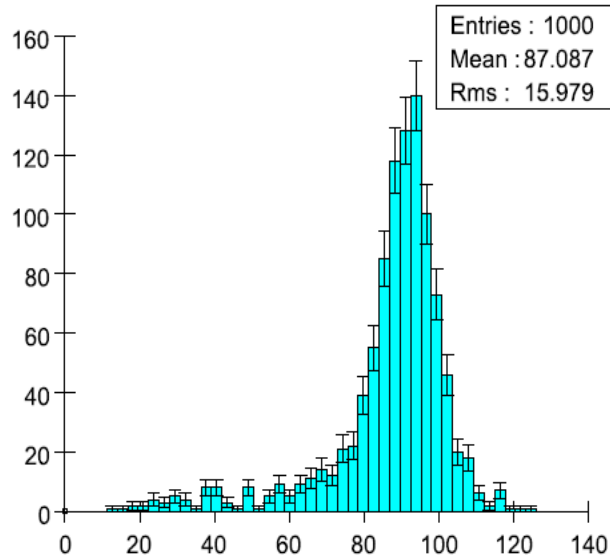
Need RMS90

Better Plots

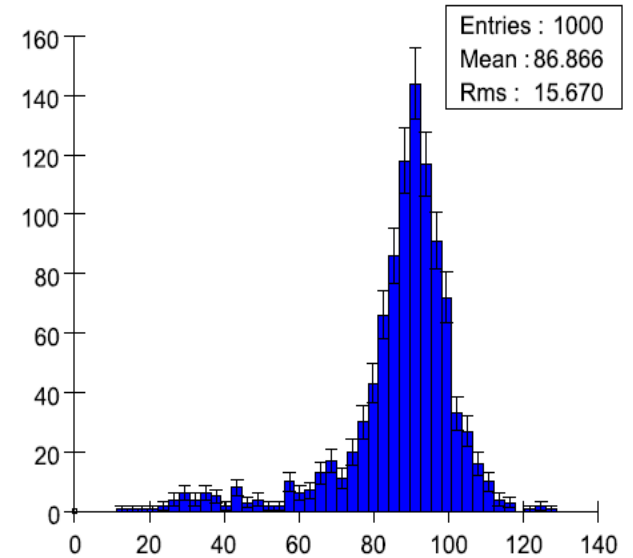
eventMass for 32 HCAL Layers



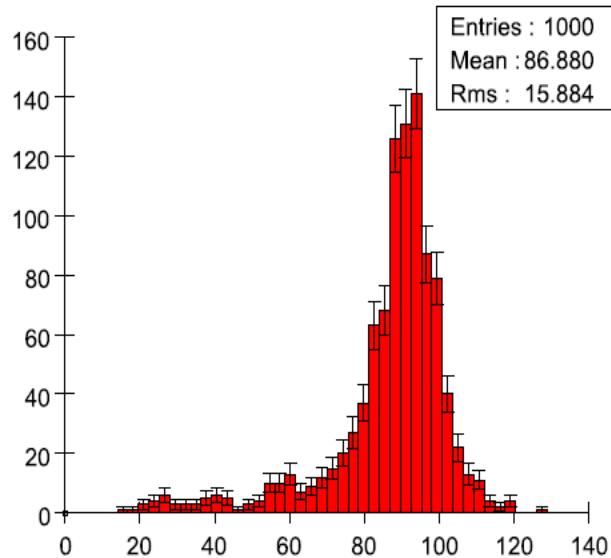
eventMass for 33 HCAL Layers



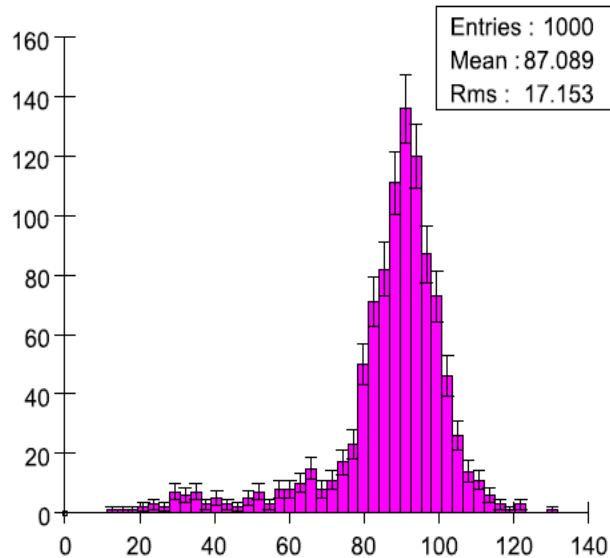
eventMass for 34 HCAL Layers (sid01)



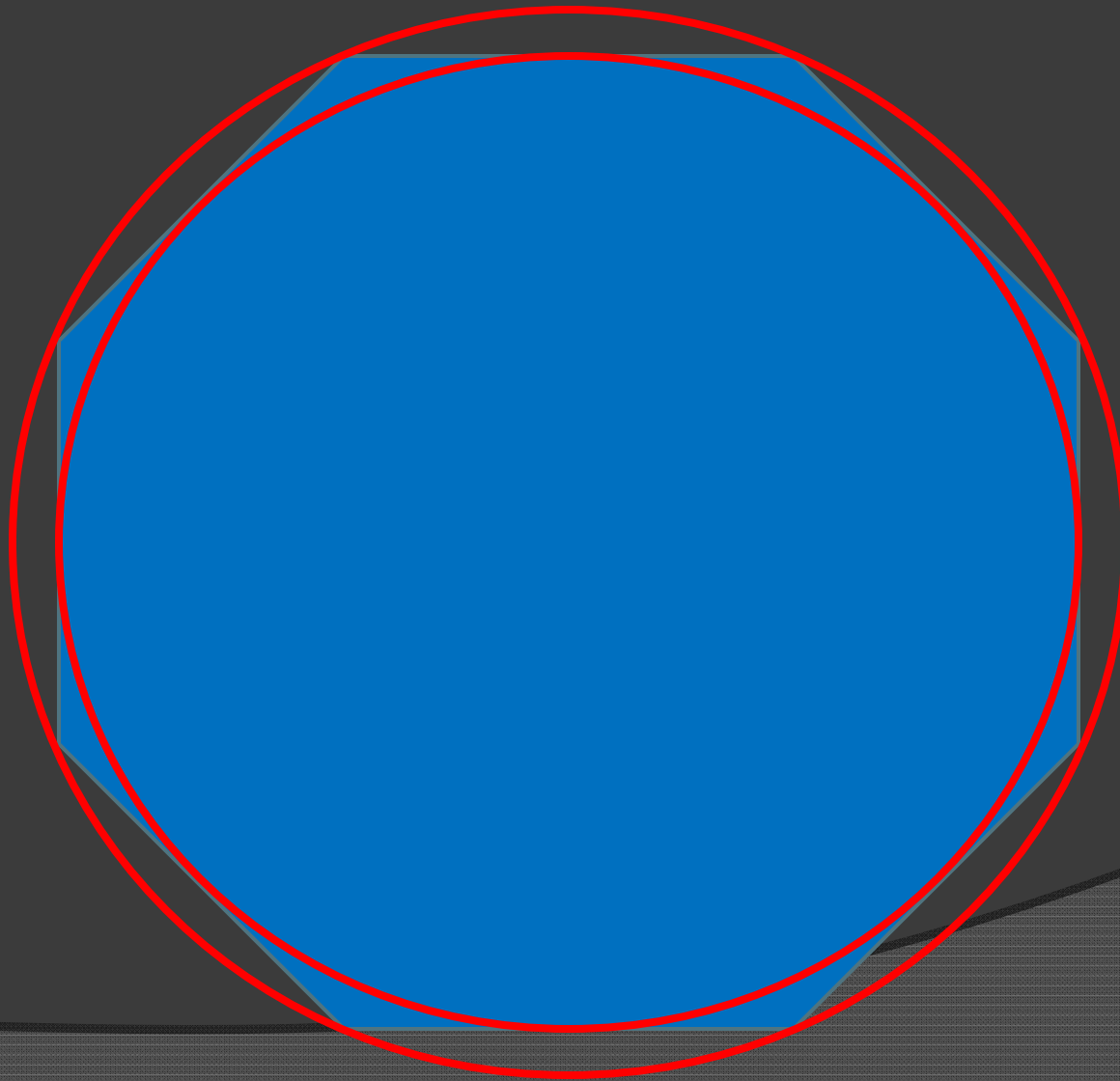
eventMass for 35 HCAL Layers



eventMass for 36 HCAL Layers



An Oversight: Wired vs Reality



Conclusion

- ⦿ Really just starting the physics, a lot of work to be done
- ⦿ Open to suggestions for interesting detector studies

Thanks for all the help SLAC!



Ray



Mat

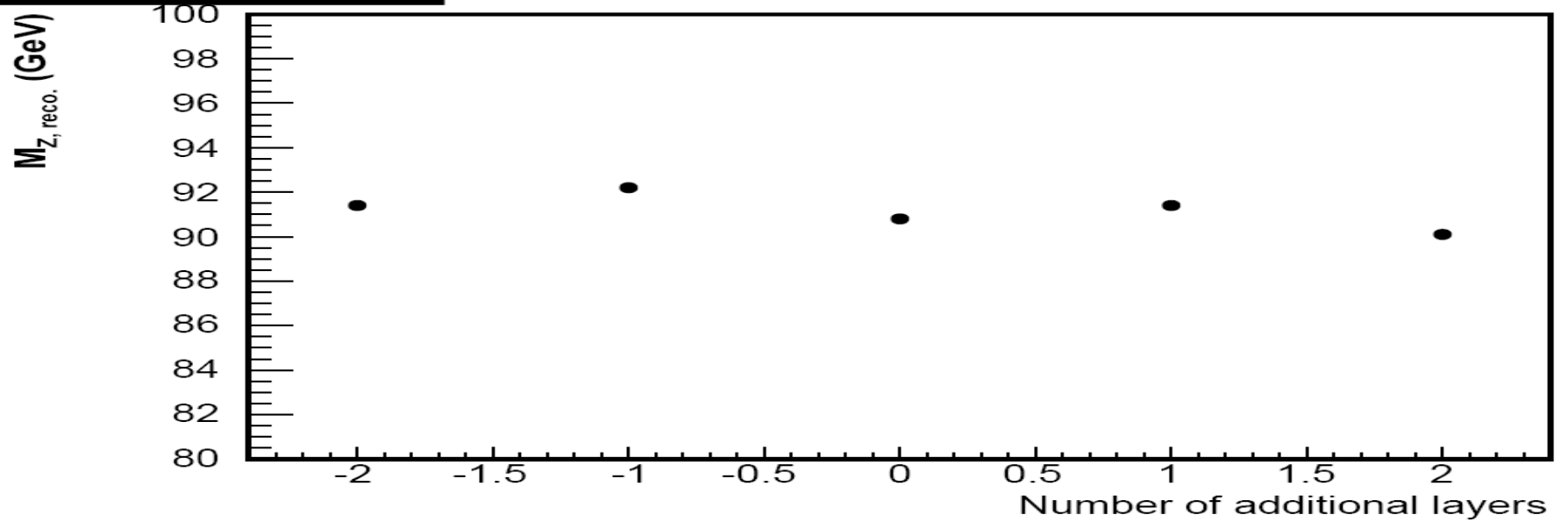
Ron



Jeremy

This Just In

Z mass reconstruction



Z mass resolution

