Event visualization in Python

Tyler Kutz

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Overview

Requirements:

- Python for main script
- vpython module for building detectors and tracks
- PyROOT for reading event information from ROOT file

Visualization script:

- Builds VDC (inactive, for spatial reference only)
- Builds shower and preshower calorimeters (active, displays event information)
- Loops over entries from ROOT tree
    - Projects track from VDC through calorimeter
    - Colors blocks that are part of the calorimeter clusters
   - Clears event from visualization and moves to next event

Geometry
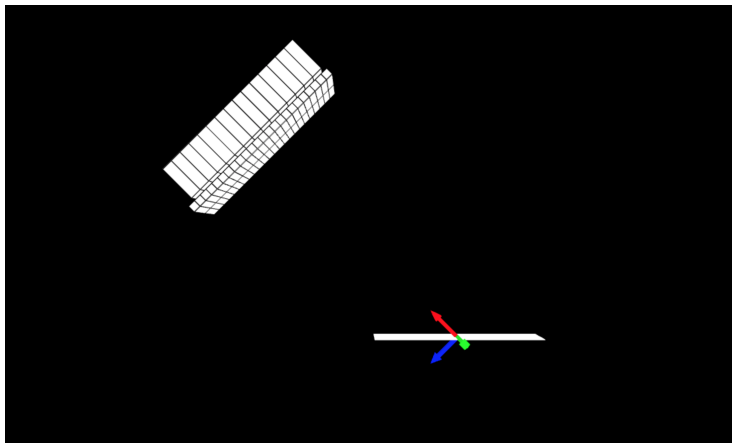
- Transport coordinate system
- Shower and preshower calorimeters currently the only active geometry
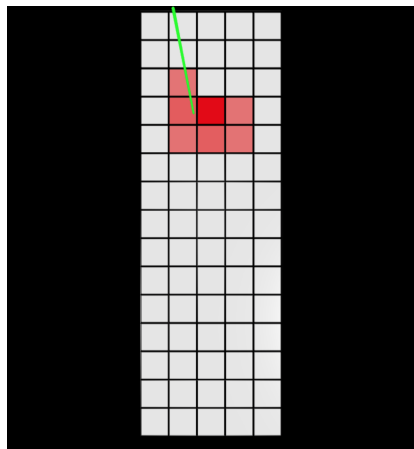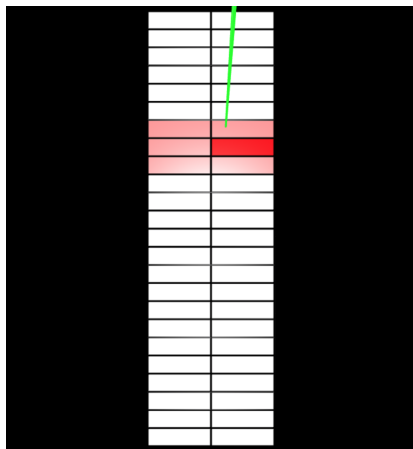- Dimensions and positions obtained from database

Events
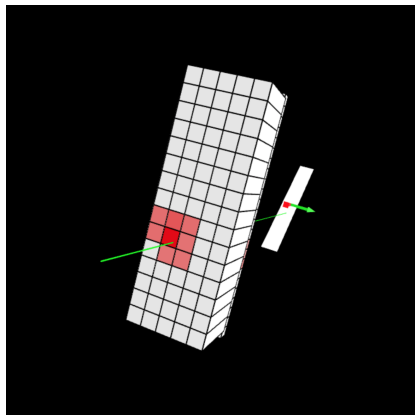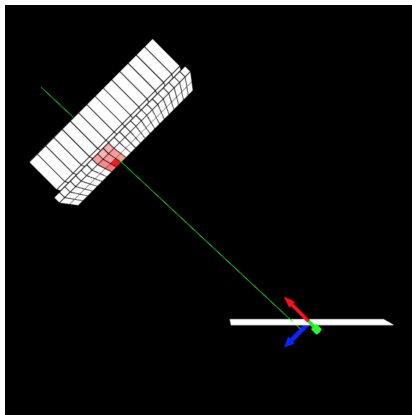
- Track (green) is projected from VDC through the calorimeter
- Blocks belonging to cluster are colored red
    - Saturation indicates relative ADC signal for this event
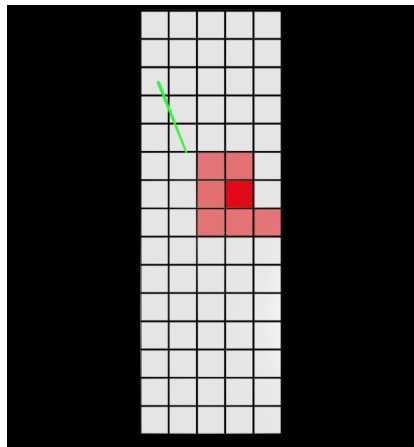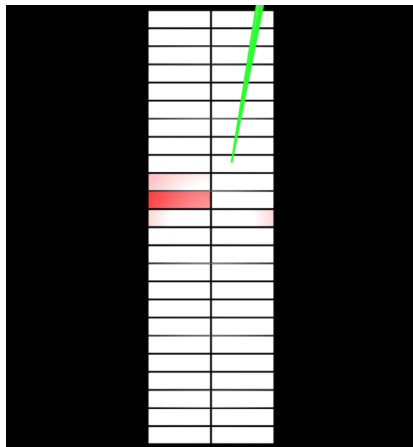
Good event
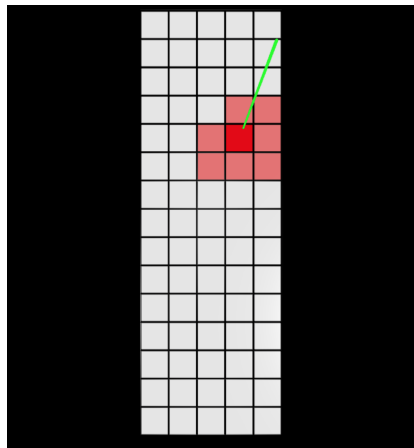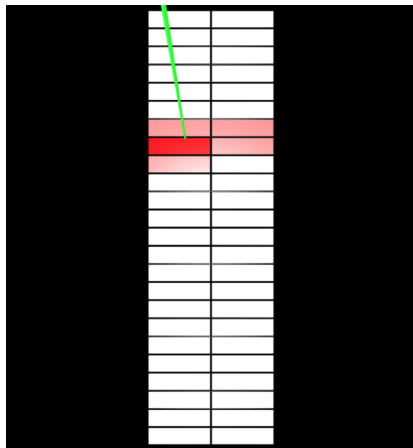
- Track intersects brightest block
- Brightest block roughly centered in cluster

Another event

- Track intersects adjacent to brightest block

Questionable event

- Track misses cluster
- With similar cuts as used for calibration, this is about as bad as it gets
- If no cuts are applied, cluster/track separation can be quite large

Comments

Improvements that could be made:

- Create similar script for LHRS

- Add additional detectors

- Widget GUI:
    - Cycle through events
    - Control camera angle
    - Add/remove cuts on various event parameters

- Other suggestions?

> - This may not be the best tool for the job
>
> - However, if people are interested in using/adding to the script, I can put it in a public place