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L1 Cal Trigger Tower Monitoring

The L1TCC can capture all the tower energies of events at a low rate and serve this data to client programs. This provides a way of monitoring low-level information for a subset of events, including events that do not pass the trigger. The existing run IIa L1 Cal Trigger Tower energy monitoring runs on the L1TCC, and outputs a text display to the screen of that node, in MCH1. The short term goal of this project is to take this same display and put it into a GUI which is more easily accessible.

The long-term goal is to create a Python-based GUI to monitor the occupancy of the cells of the Trigger Tower. There are two major steps in this project.

First is utilizing the ITC (inter-task communications) library in Python to extract the information from the L1TCC into the program. A D0 Python Library (called itc, conveniently) exists for this purpose. This will allow a GUI to display the information.

Next is creating that GUI. Based on the architecture of the Trigger Tower, the display will work in a manner such that all forty values of eta (-20 to +20, except 0) will be shown for each phi (0-31). Since a 40x32 grid would be visually unmanageable, the display will be split (possibly by tabs that a user can move between) into reasonable portions, possibly into eighths in accordance with the calorimeters octants.

Using a GUI to do this monitoring will not only provide a user-friendly means of viewing the data, but an EPICS-like alarm system can be used to monitor the behavior of the system. This will help shifters more readily recognize issues in the L1 Cal.