Background

Baryon: Neutron

Meson: Kaon
$\mathbf{K_L} \rightarrow \pi^0 \nu \bar{\nu}$

- Kaon lifetime: $5 \times 10^{-8}$ s (50 ns)
- Branching ratio: $2.8 \times 10^{-11}$
Experimental Goals

• Observe the decay mode $K_L \rightarrow \pi^0 \nu \bar{\nu}$
• Measure 100 events to determine the branching ratio to a higher accuracy ($3 \times 10^{-12}$).
• Search for new physics beyond the standard model.
• Use the measurement of the branching ratio to study CP violation (matter/antimatter asymmetry).
Decay of the kaon involving the charged Higgs boson (not seen).

Decay of the kaon involving a possibly unknown particle, X.
Experimental Setup
Experimental Setup

- Charged Veto (CV)
- CsI Calorimeter
- Main Barrel (MB)
- Front Barrel (FB)
- Neutron Collar Counter (NCC)
The DAQ System

ADC Crates

Signals From Detectors

MACTRIS

Level 1 Trigger Crate

Level 2 Trigger Crate

Fanout Crate

Master Fanout
The DAQ System
Project Goal: Conduct a study to see if there is a relationship between the pedestal values and temperature of the ADC board.
Method

• Use a variac variable transformer to change the voltage administered to the fans in the crate.
• Slow the fans, the temperature in the crate increases.
• Take pedestal readings at various temperatures.
• Other studies include looking at dependence of RMS and gain on temperature and identifying the temperature dependent component on the board.
Results

Temperature vs. Pedestal Value

Temperature in Degrees C

Pedestal Value
What a fun summer! Thanks!
References

