High Voltage Diagnostics and Trouble Shooting in MicroBooNE

(The MicroBooNE Collaboration)

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Abstract

At the end of January, MicroBooNE ramped down it's drift HV system after a series of unusual and worrying behavior on HV monitoring plots. This document presents a summary of the tests performed, diagnostics developed, and a chronological ordering of events.

III. SYMPTOMS

A. Pickoff Point Instability

B. Glassman Current RMS

C. TPC Asic LV Current Draw

D. "Burst" Events

IV. DIAGNOSTICS

A. (Warm) HV Supply Tests

1. Glassman HV Supply replacement

2. HV Cable inspection

3. AC Power Distribution Inspection

4. "In air" Test of HV Supply

B. V vs. I Tests on cathode

C. Pickoff Point Measurements

1. Current-source mode measurements

2. Measurement of field cage resistance

3. Voltage-source mode measurements

4. Measurement of pickoff point resistance

5. Measurement of field cage resistance

6. Measurement of burst rate at pickoff point bias

D. "Burst" Analysis

E. Cathode Pulse Tests

V. RESOLUTION

VI. CONCLUSION