TPC dE/dx Update

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Task List

1. Compare effect of fitted/unfitted hits on <dE/dx> On hold…
2. TPC Anode voltage gain corrections
3. Truncation parameter optimization

} Beam tracks

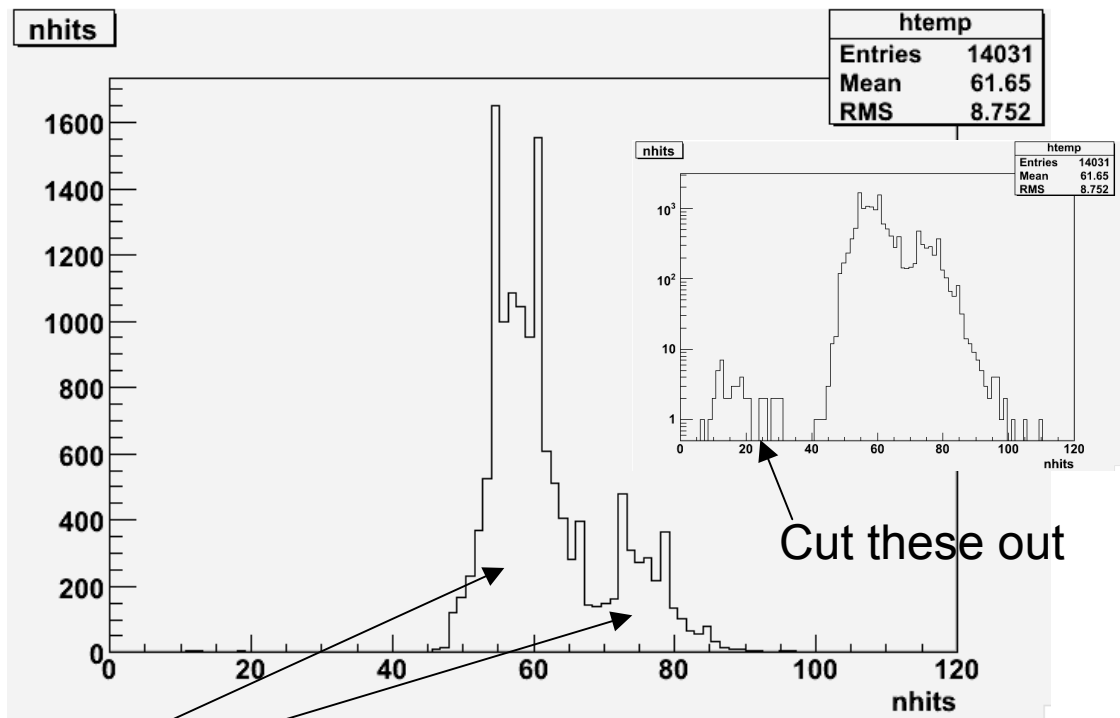
4. Resolution vs Nhits analysis/parameterization
5. Bethe-Bloch parameter extraction
6. PID likelihoods using (4) and (5) given track <dE/dx>, momentum, Nhits

Beam Tracks

Run 15860, p(120 GeV/c)+C 2%

Selecting events with one track which travels straight down the middle of the TPC ($|x-x_{target}|<10cm$ && $|y-y_{target}|<10cm$)

Double peaks in the Nhits distribution + a few low Nhits tracks

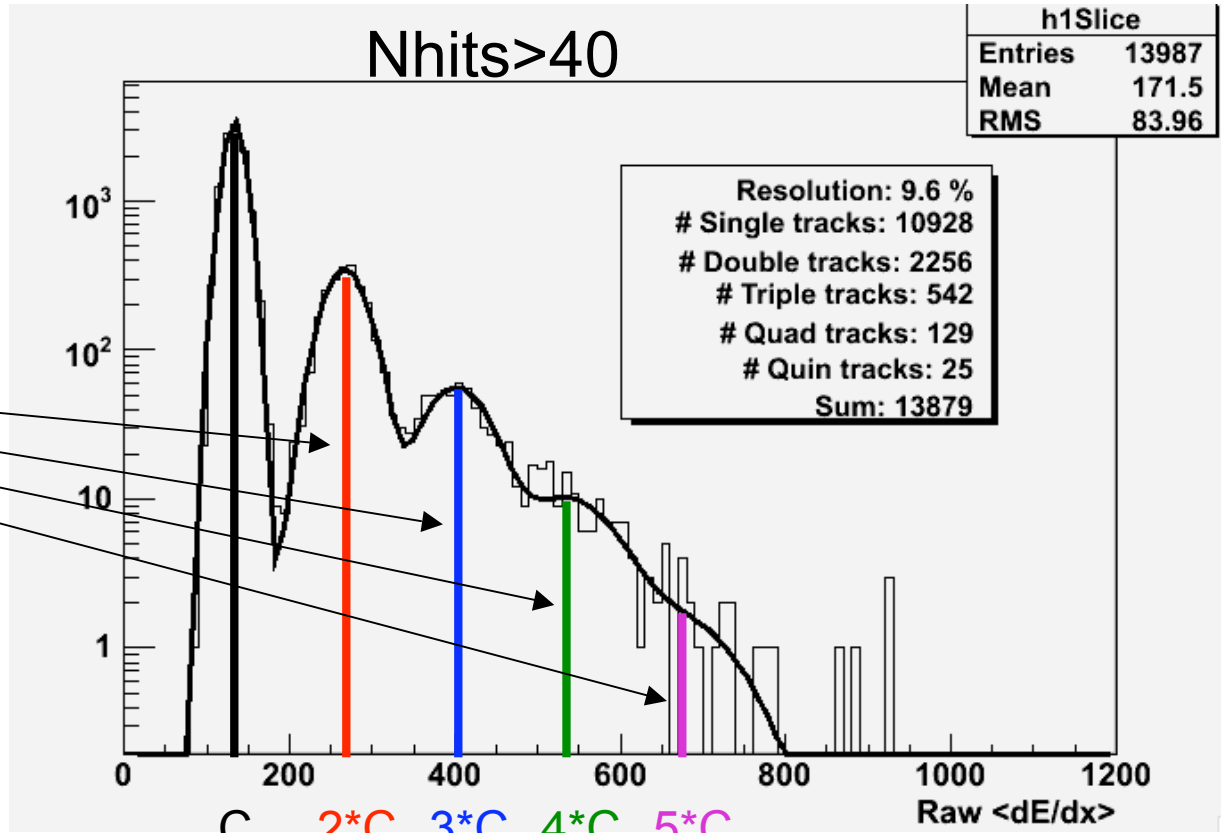


Look at these two regions separately

Raw <dE/dx> for Beam Tracks

Five-Gaussian fit (Mean, amplitude, width of first one and amplitudes of other four are free parameters)

~30% beam track pile-up

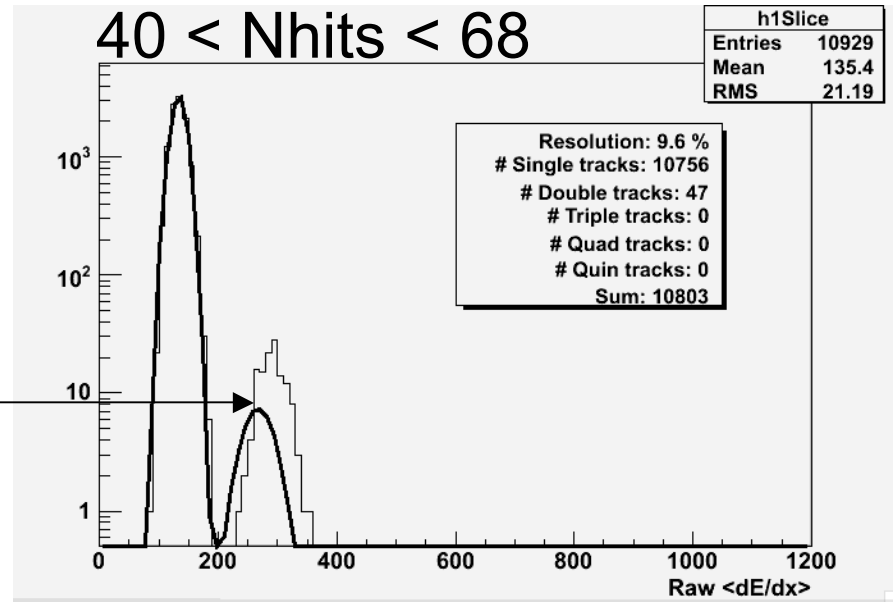


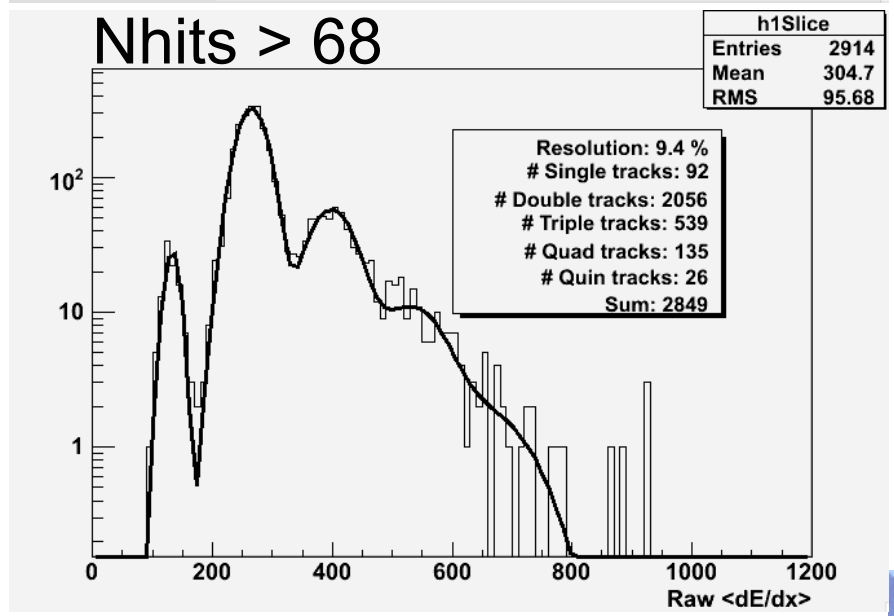
C_0 $2*C_0$ $3*C_0$ $4*C_0$ $5*C_0$

Free (Fixed in the fit!)

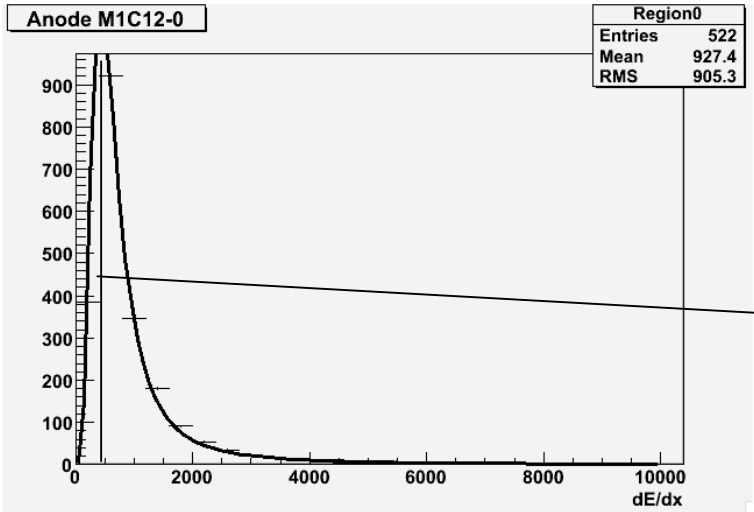
Nhits dependence

These double tracks aren't exactly "double", but only ~1% of all tracks in this Nhits range

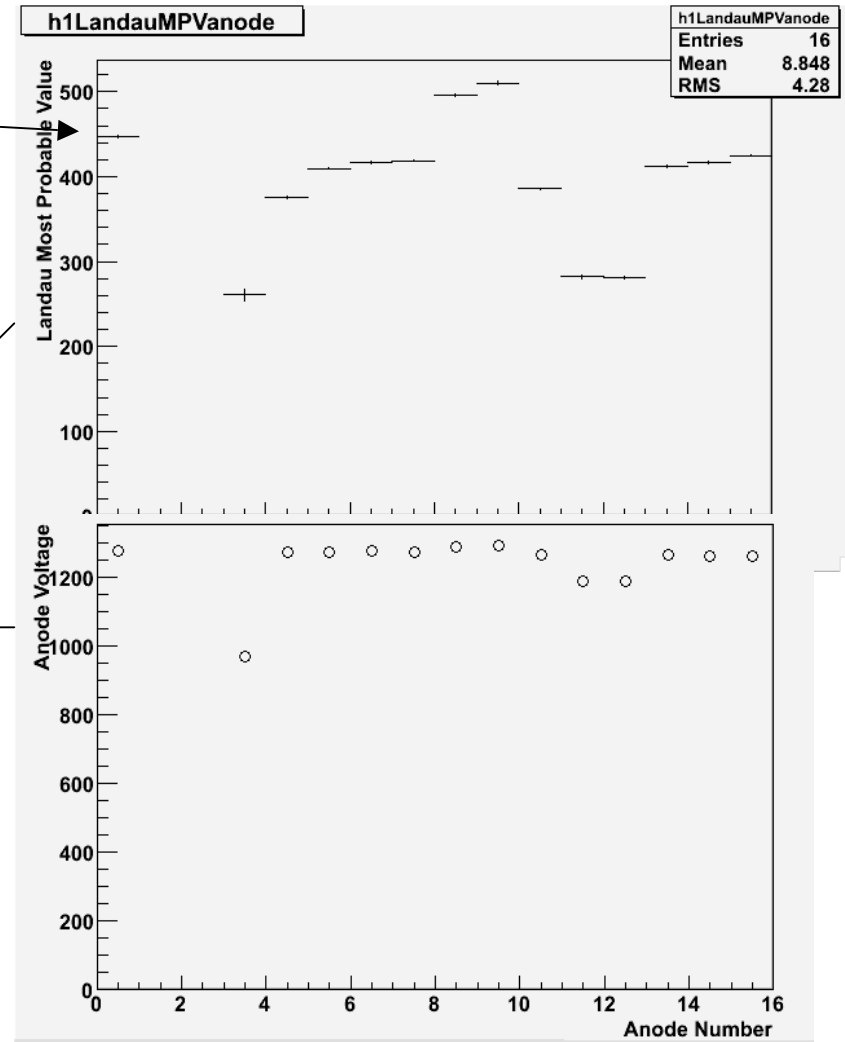




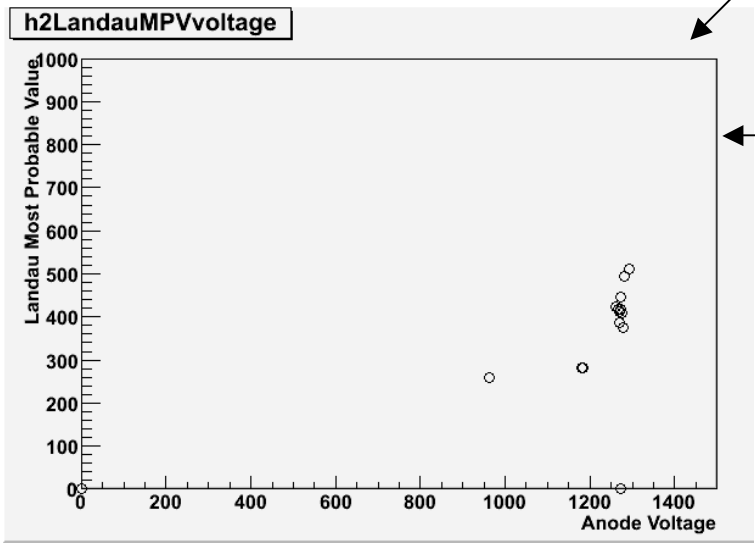
Landau Fits



Fitting Landau curve to distribution of beam track hits for each anode



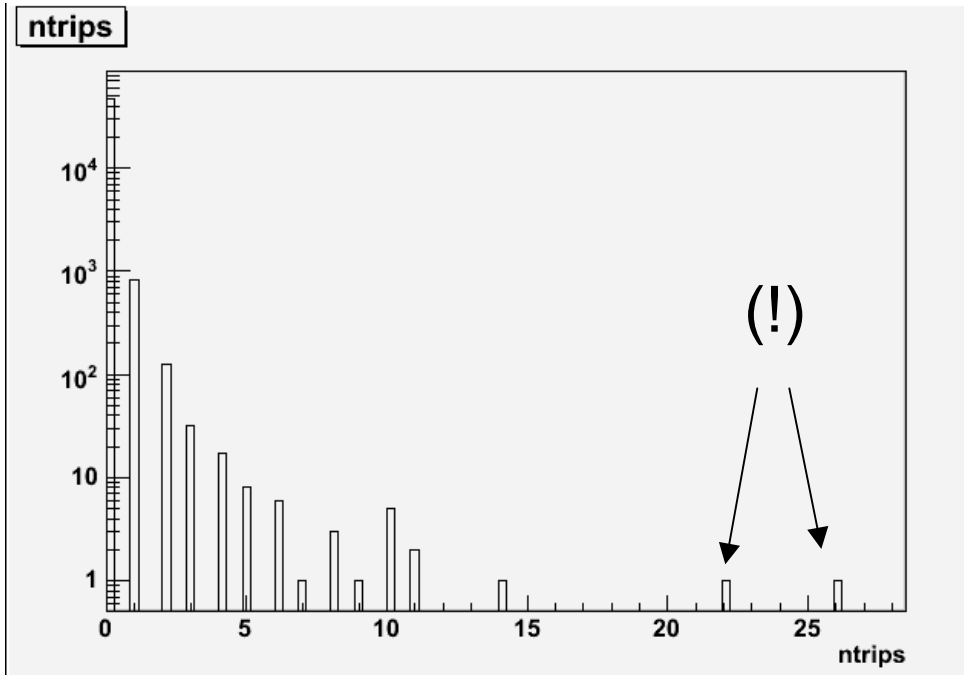
As a function of voltage:

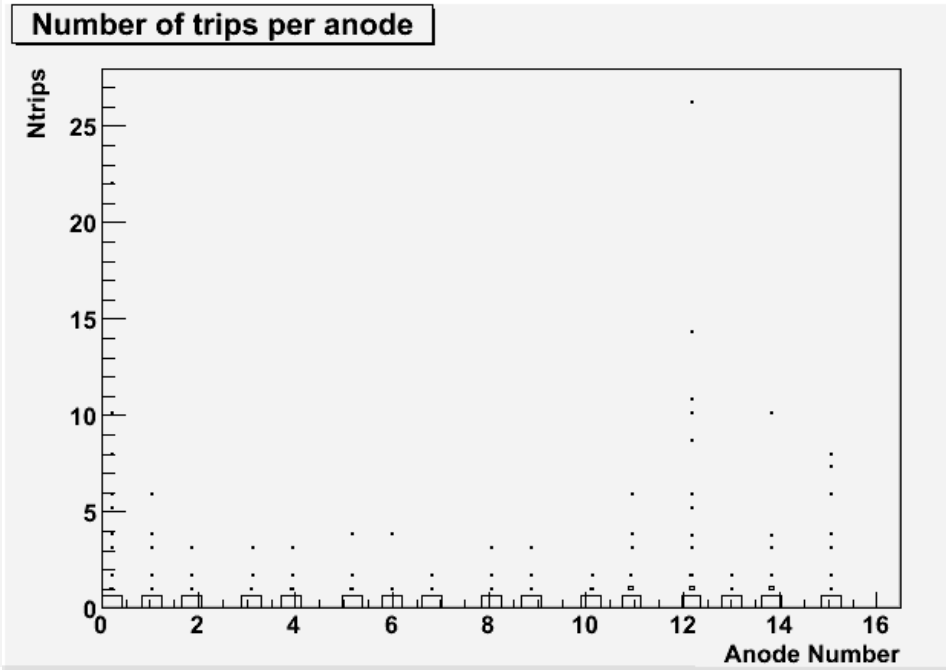


Anode stability

Integrating over all runs in round3 runlist

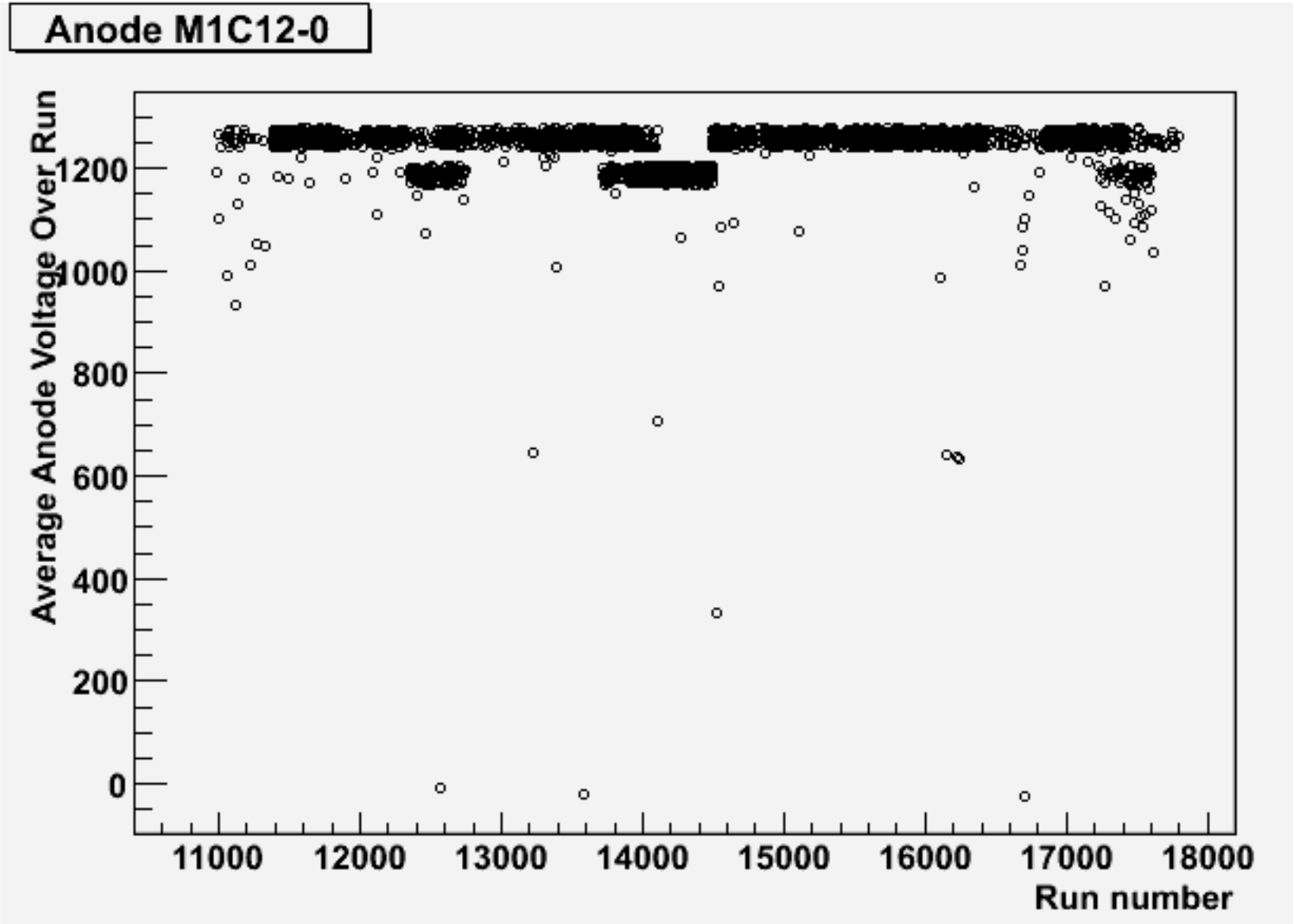
Query SlowMon for device settings (RunInfo/RIHVDev.*)



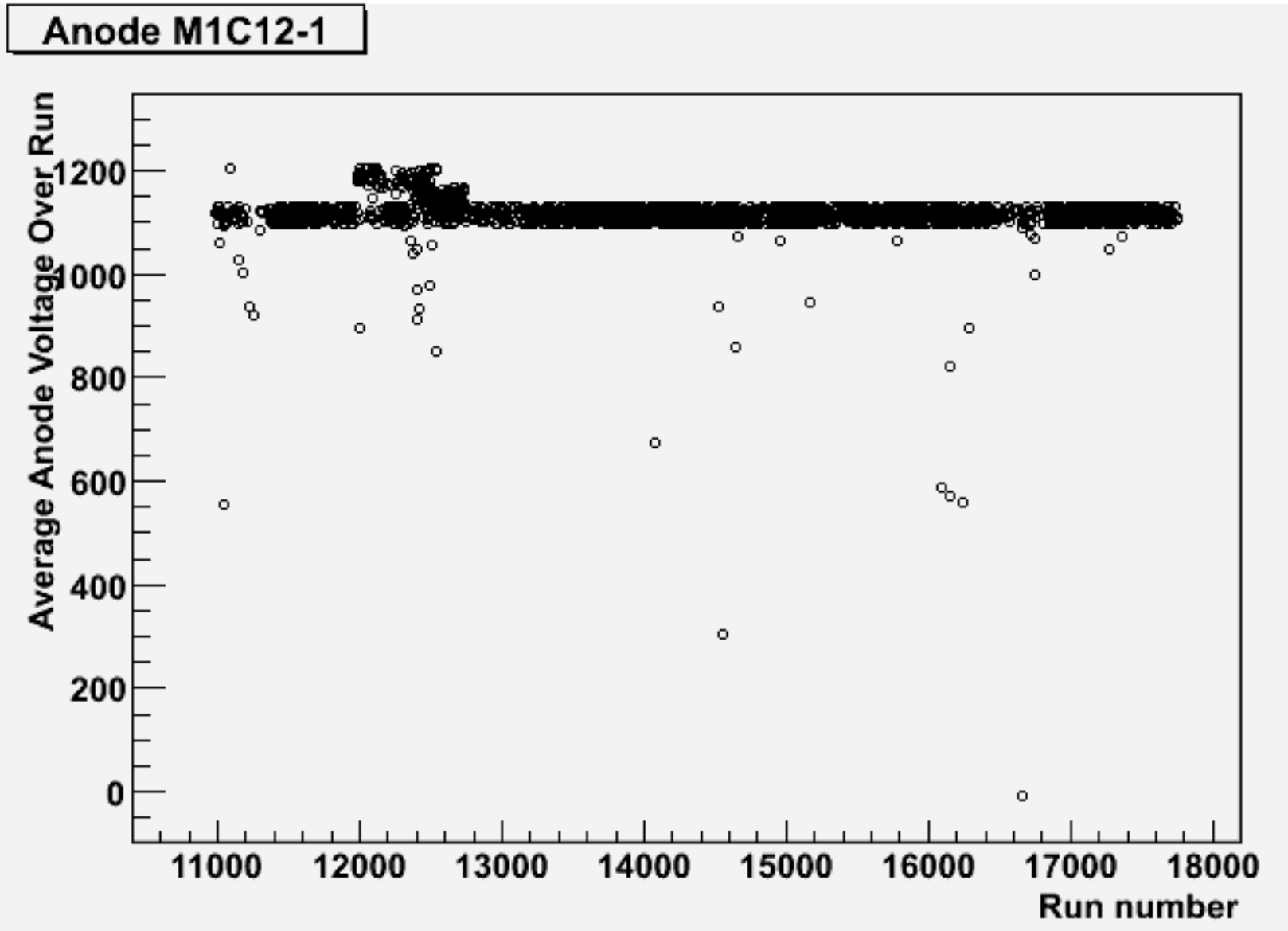


Frequency of channel trips within a given run

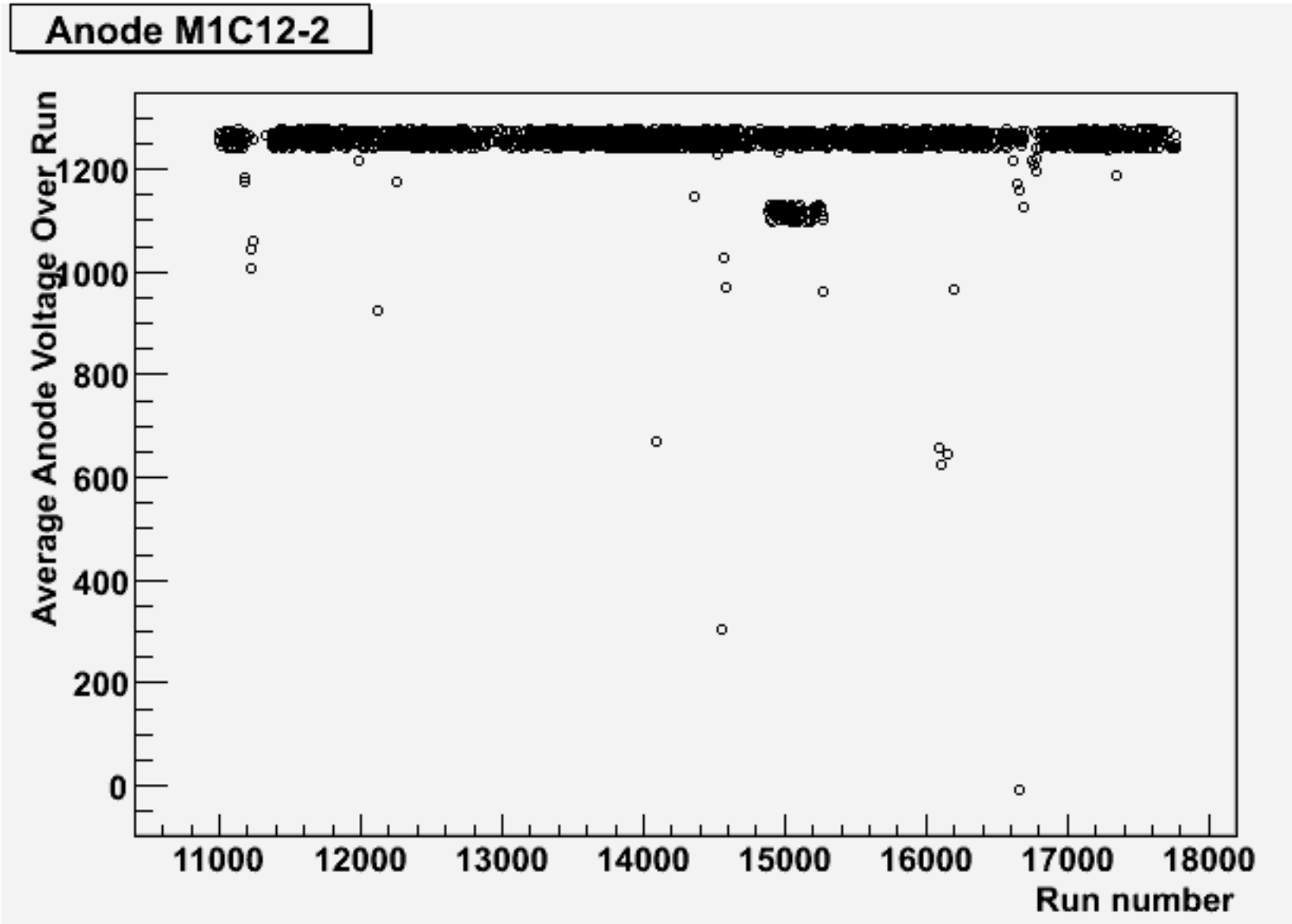
Voltage variation (0)



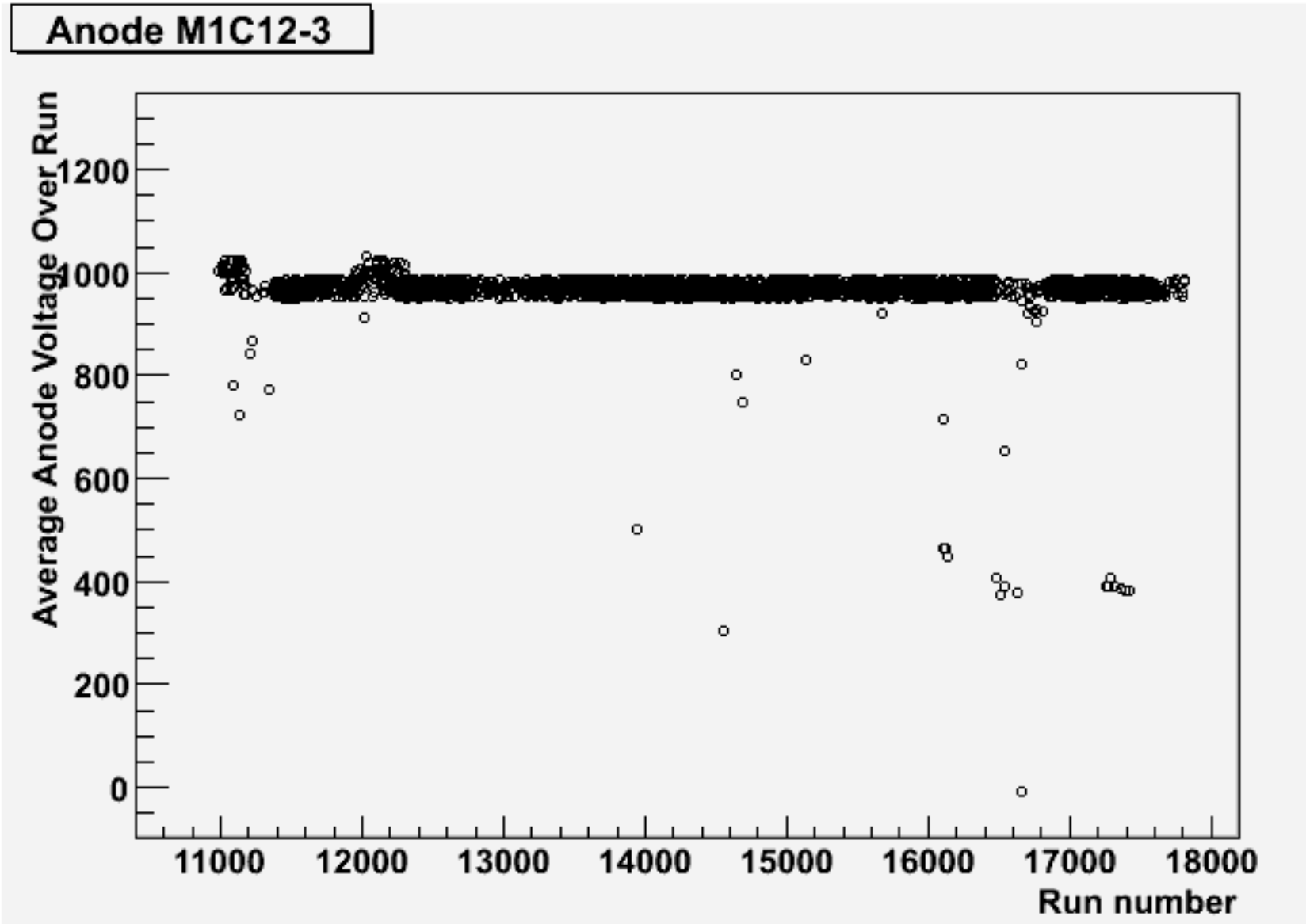
Voltage variation (1)



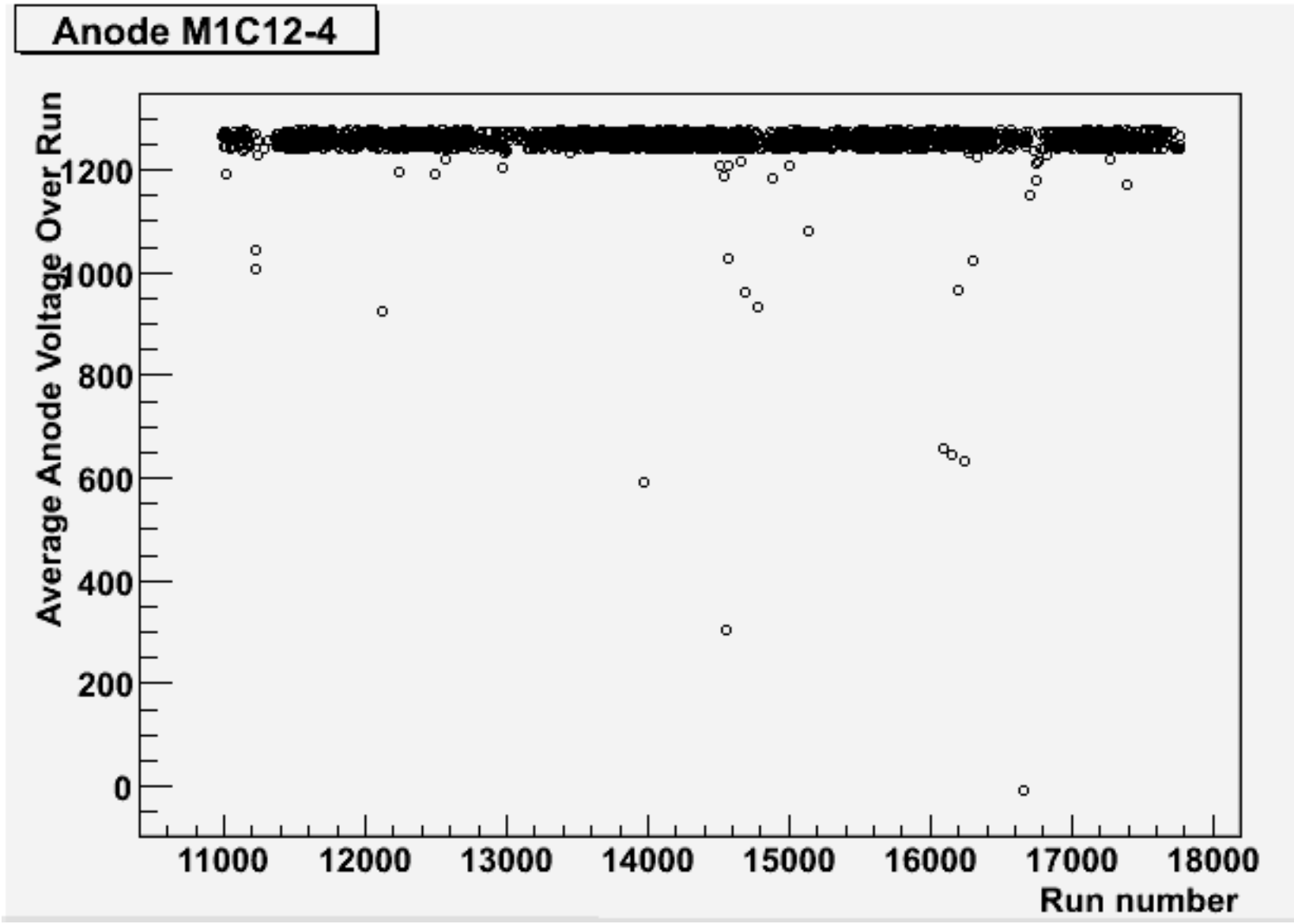
Voltage variation (2)



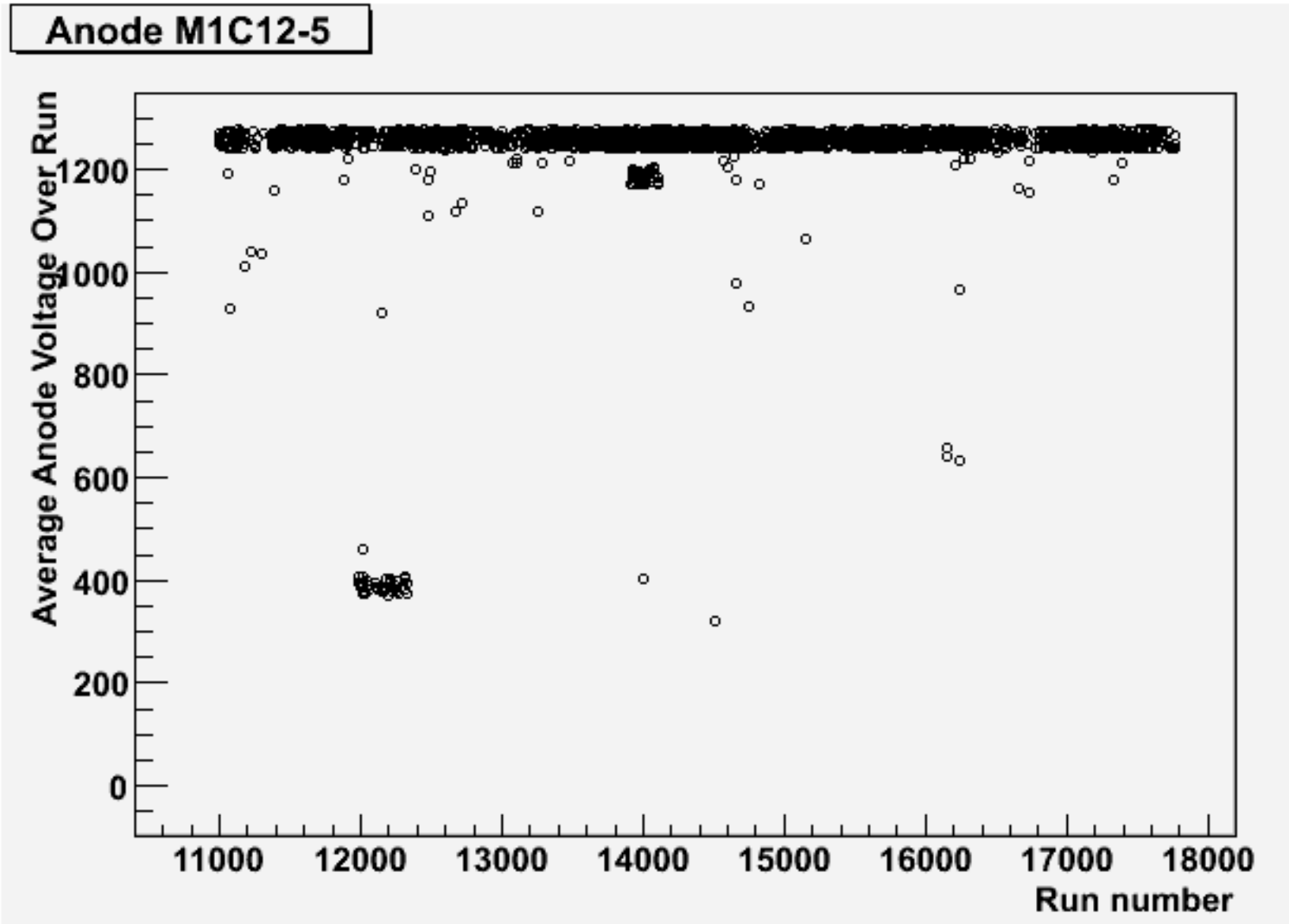
Voltage variation (3)



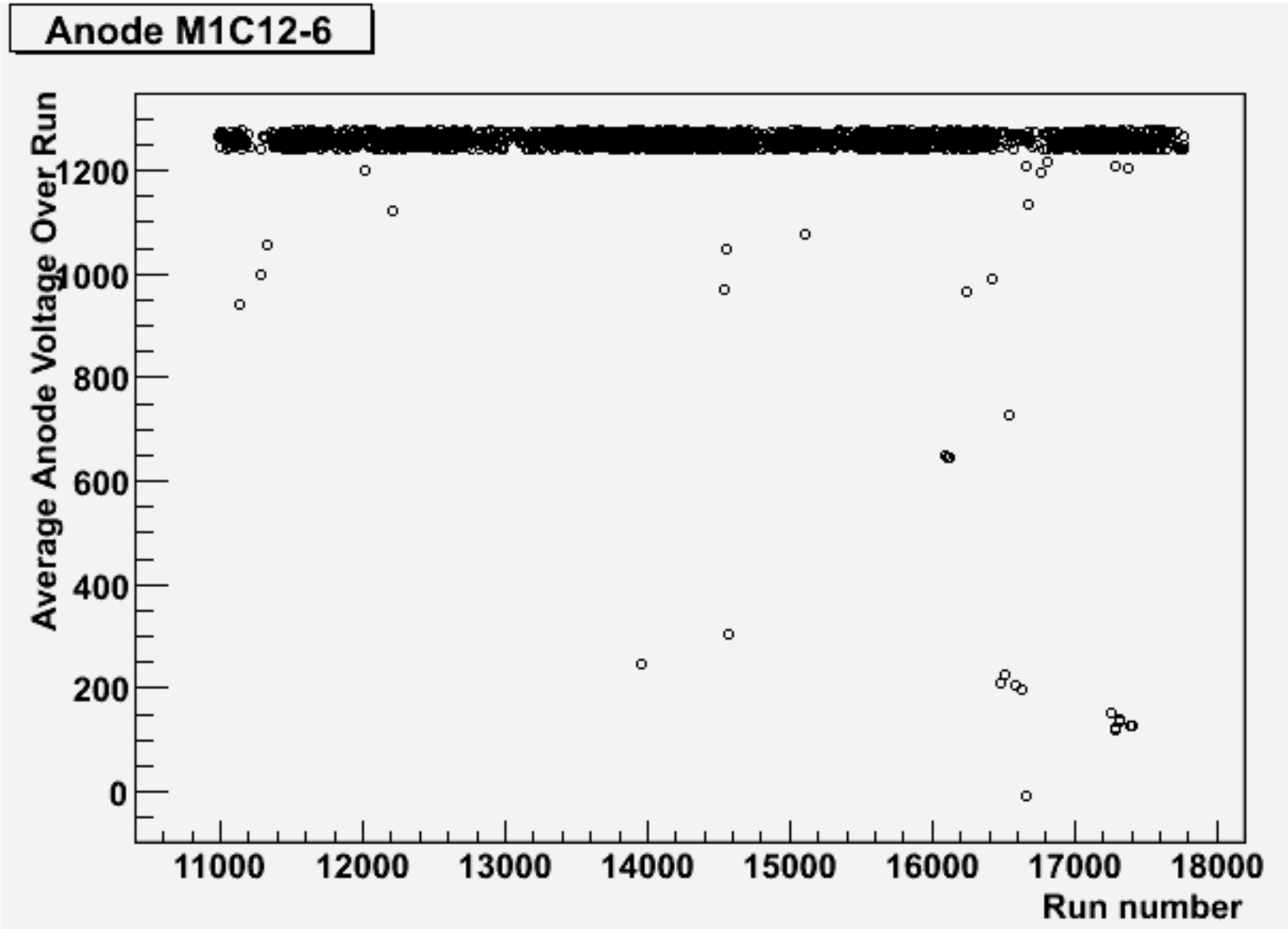
Voltage variation (4)



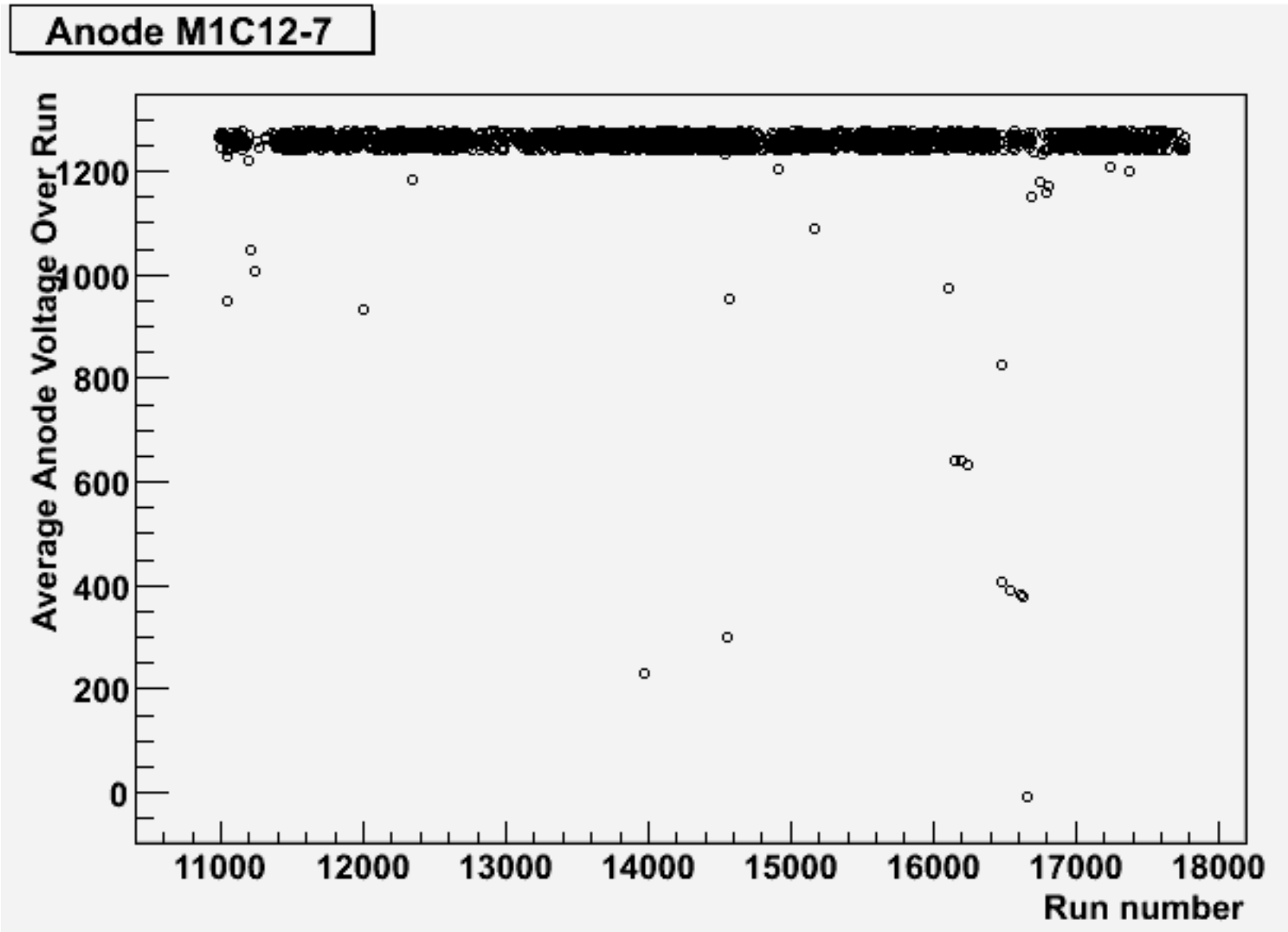
Voltage variation (5)



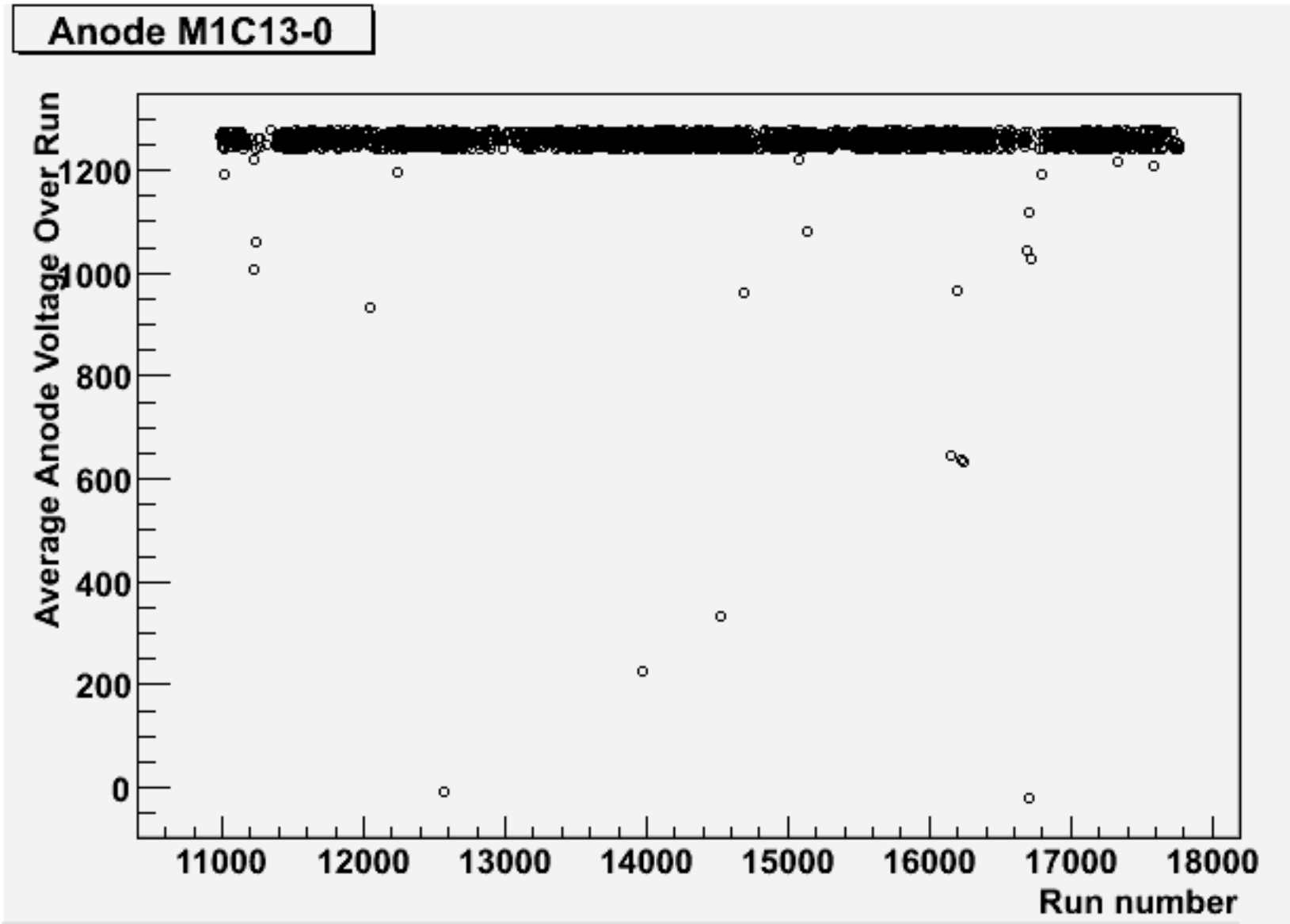
Voltage variation (6)



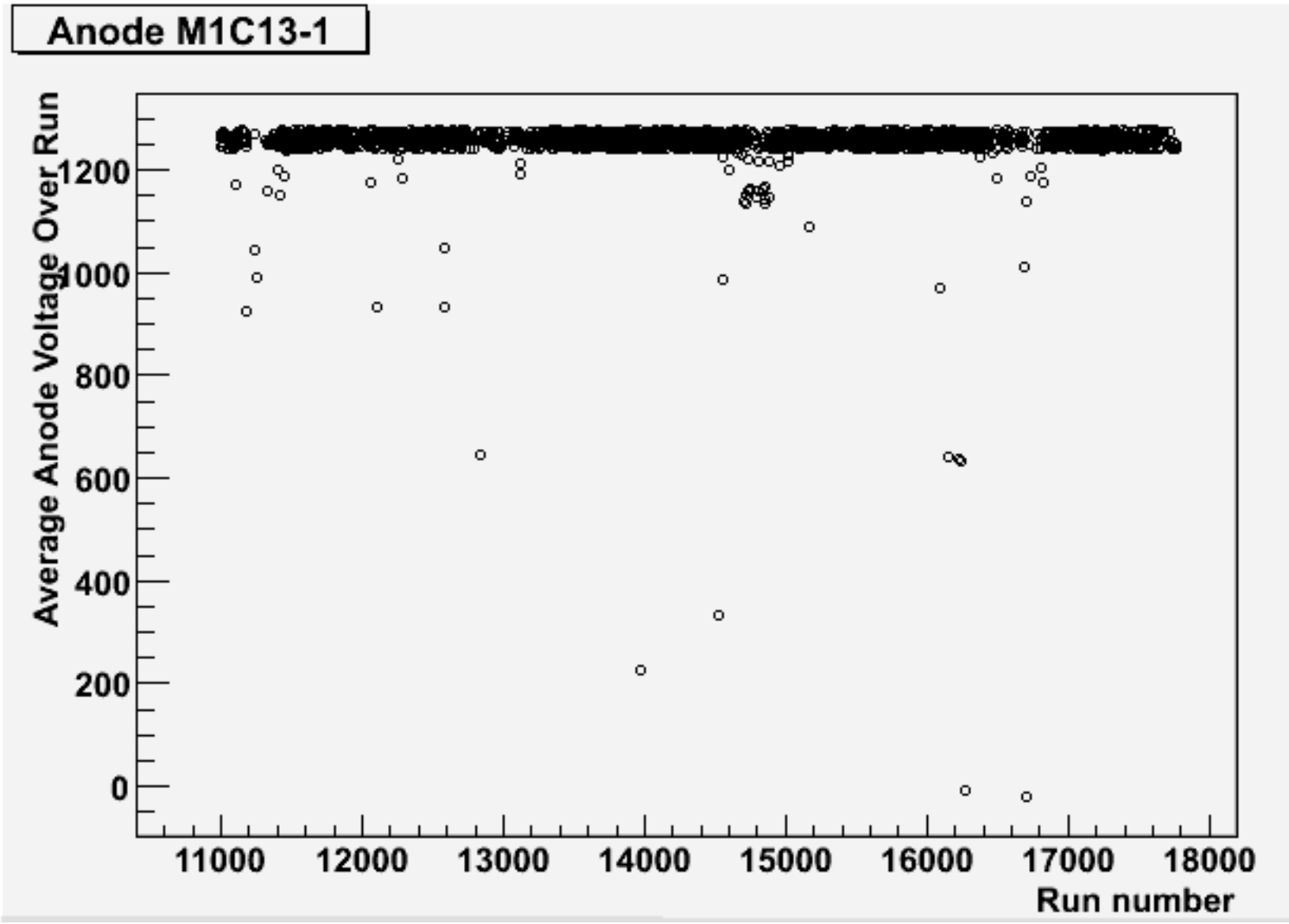
Voltage variation (7)



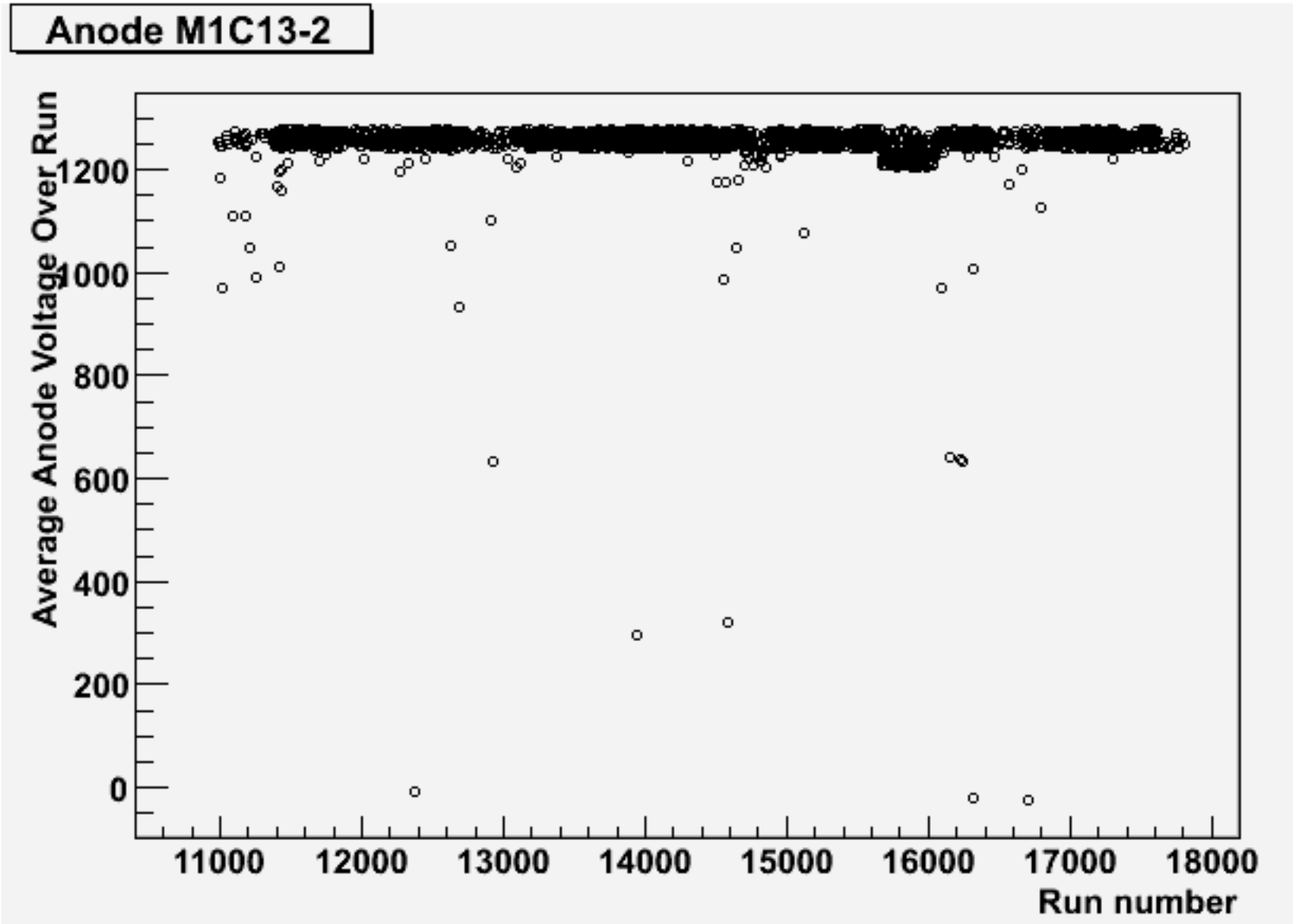
Voltage variation (8)



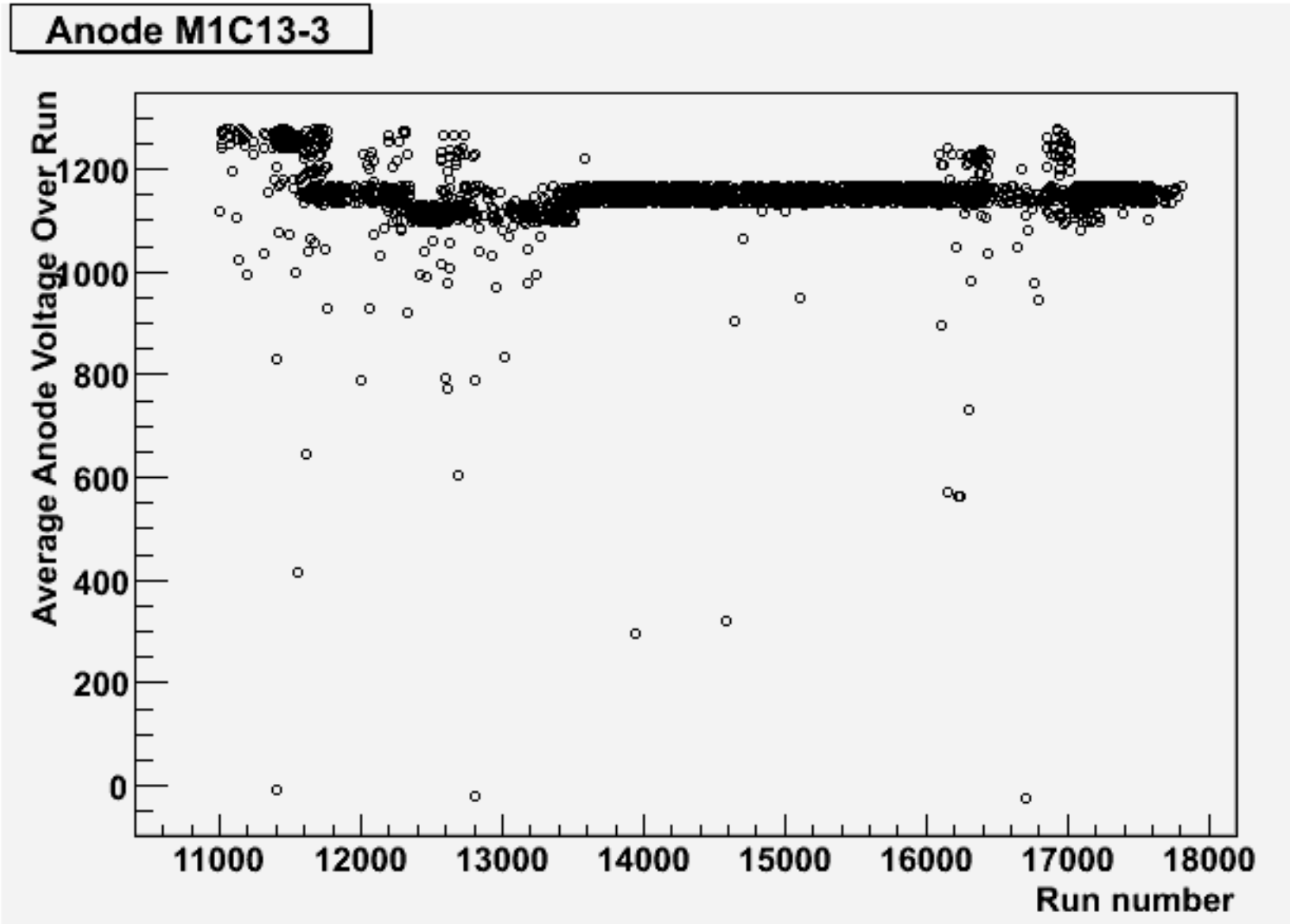
Voltage variation (9)



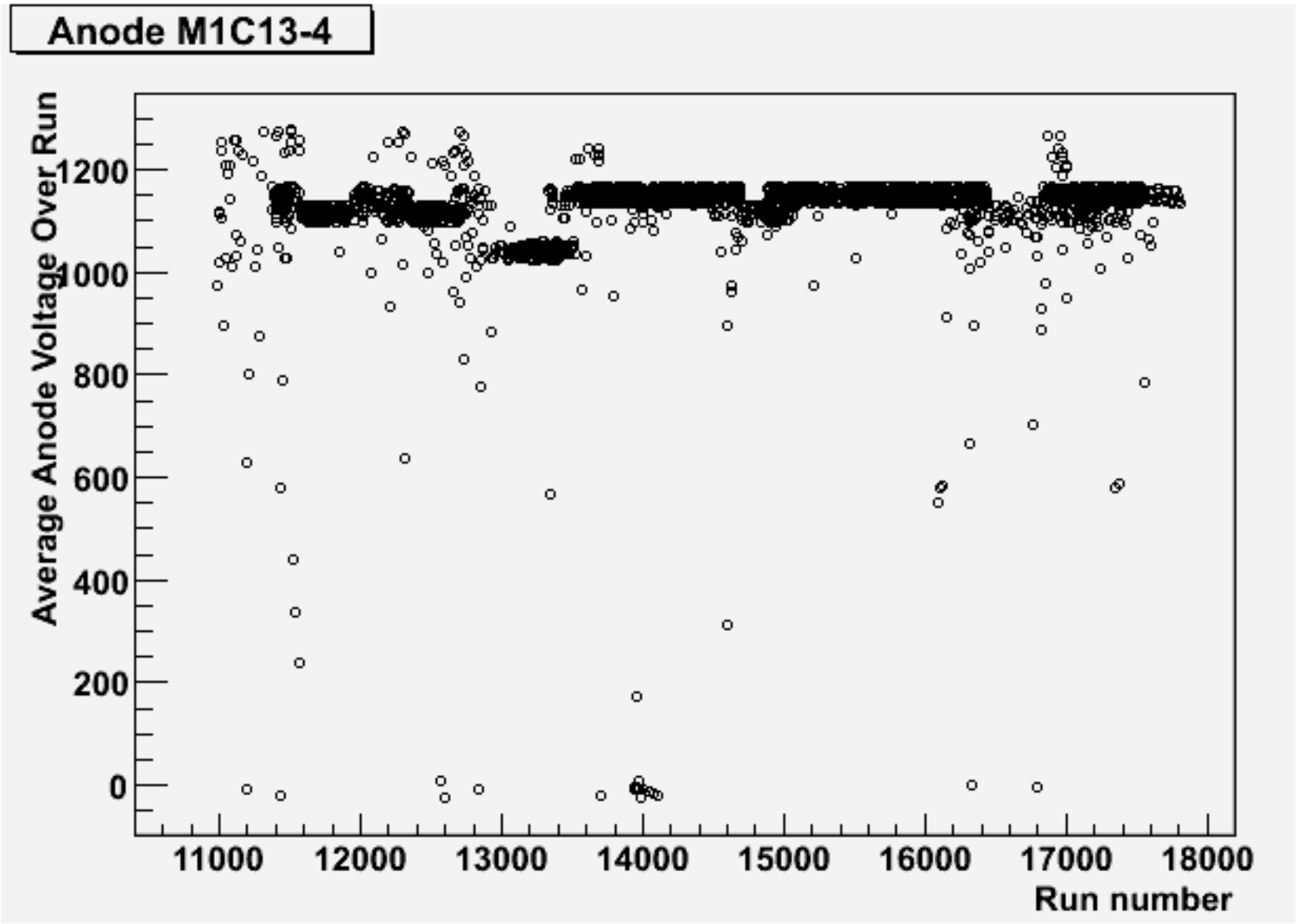
Voltage variation (10)



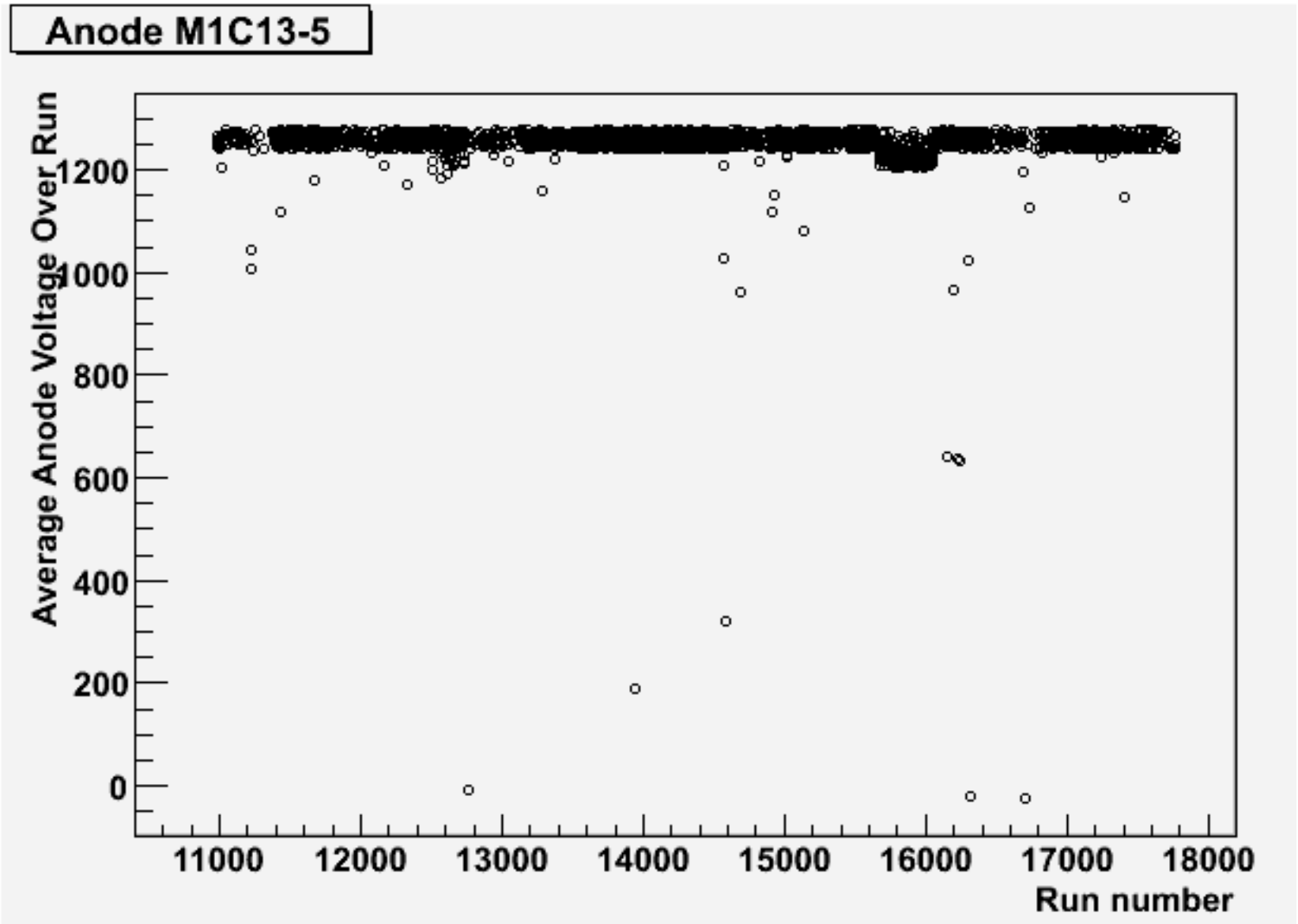
Voltage variation (11)



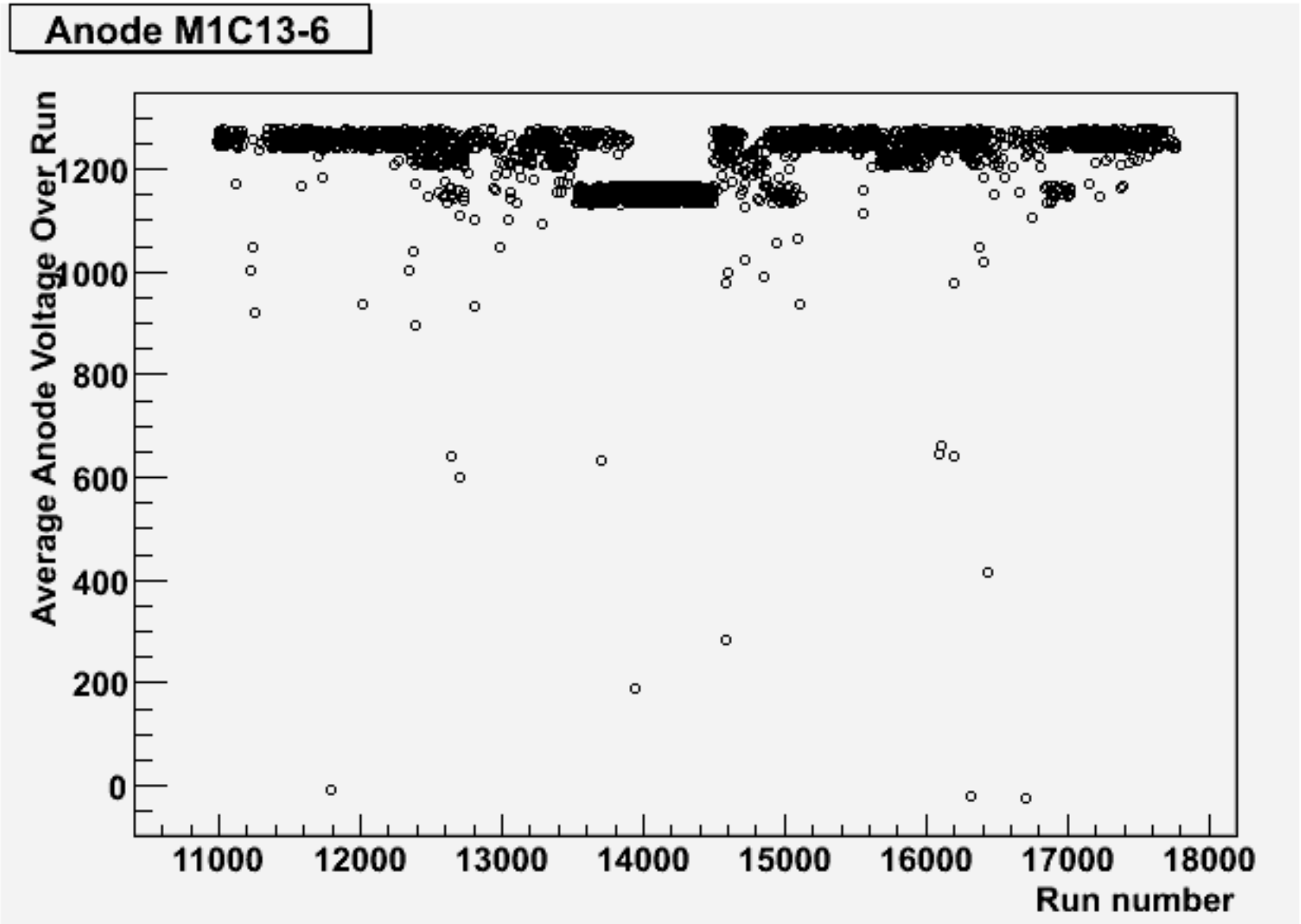
Voltage variation (12)



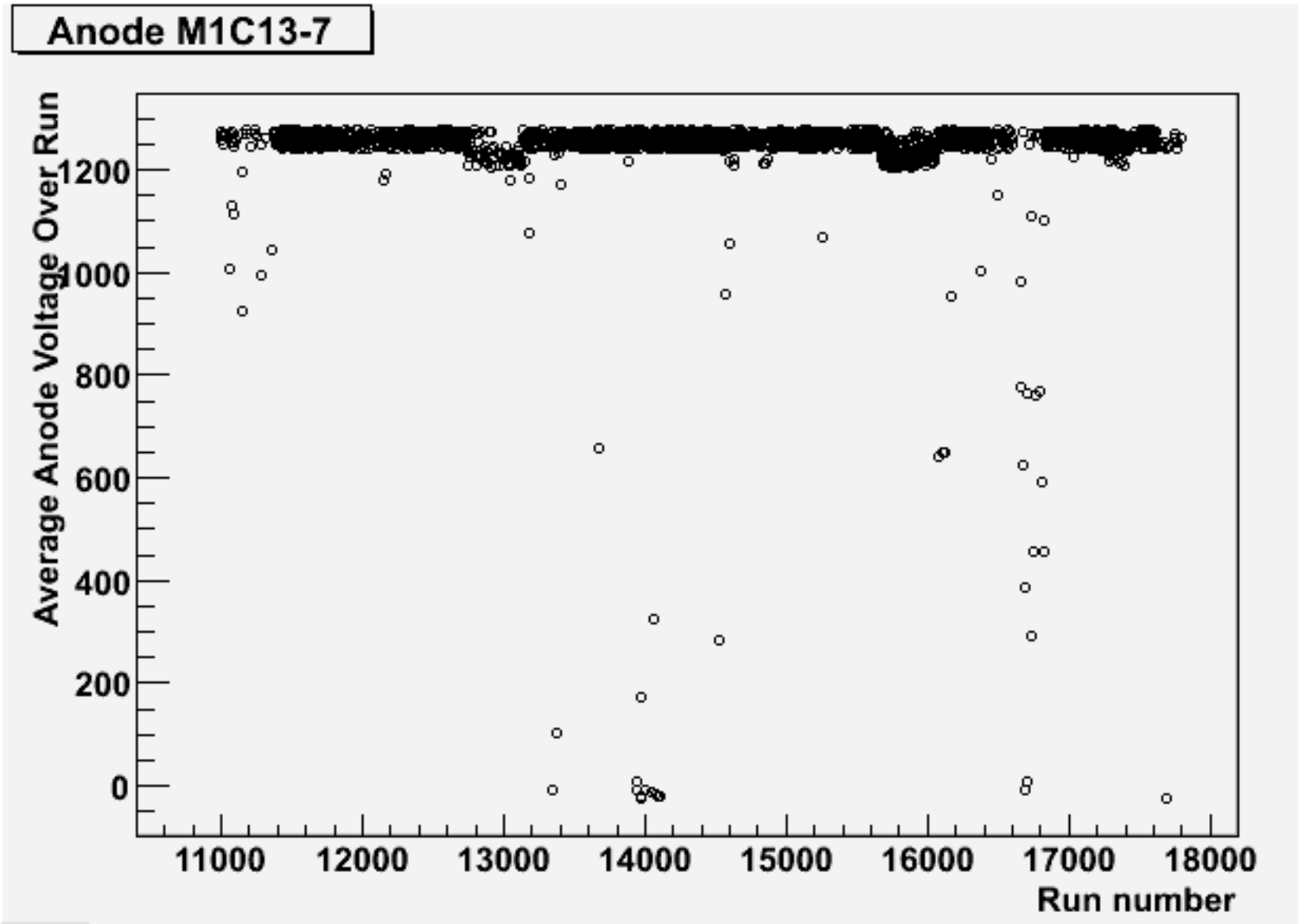
Voltage variation (13)



Voltage variation (14)



Voltage variation (15)



To-do

Combine Voltage/Trip info with Landau fit parameters

Look at MPV vs Voltage, MPV vs Anode

What fraction of data comes from runs with anomalous voltages?

Generate corrections…