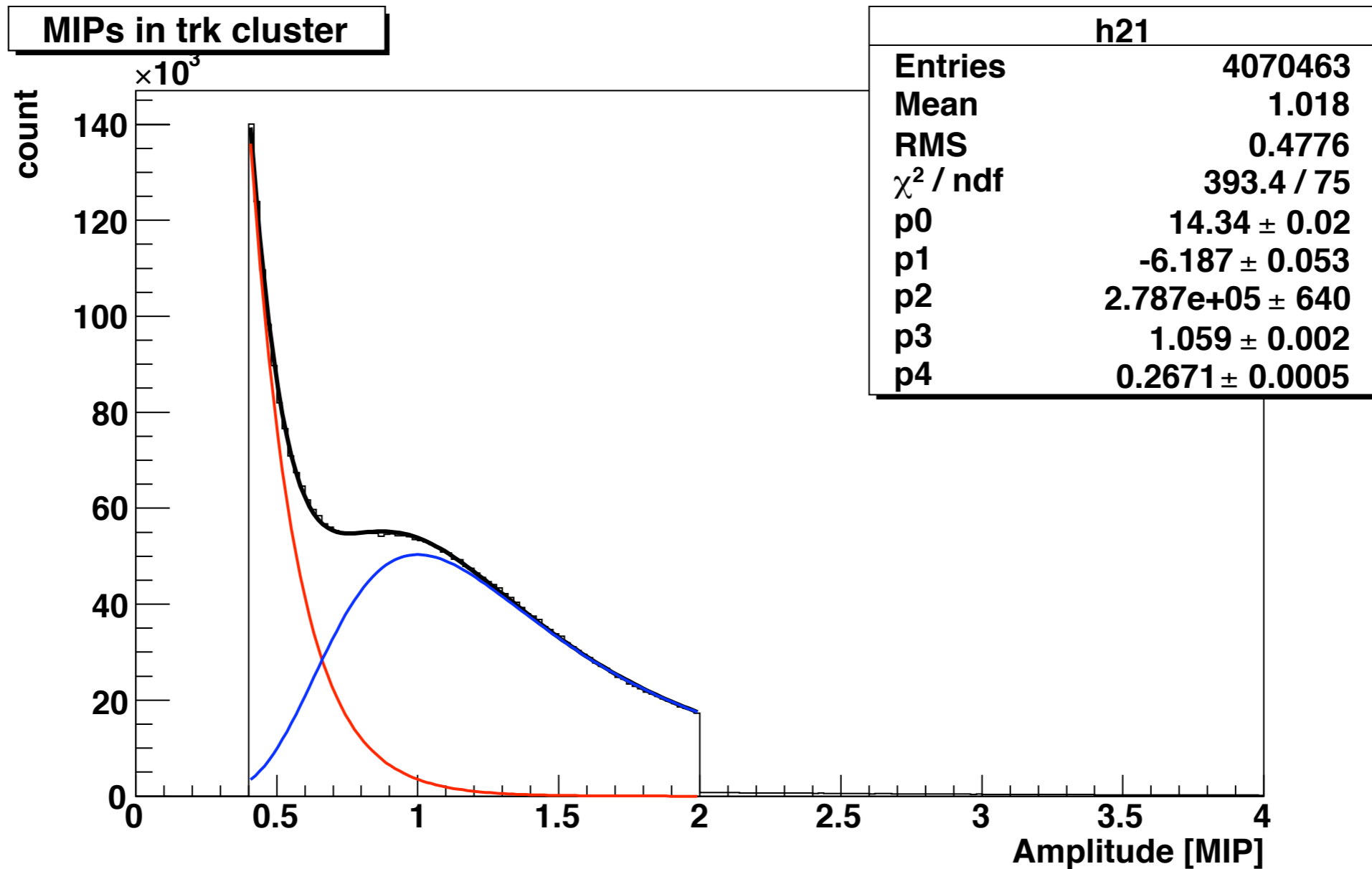


The study of temperature effect on the SiPM Gain in hadron runs

With track-like cluster events from test beam
Based on the Calice software (DeepAnalysis)

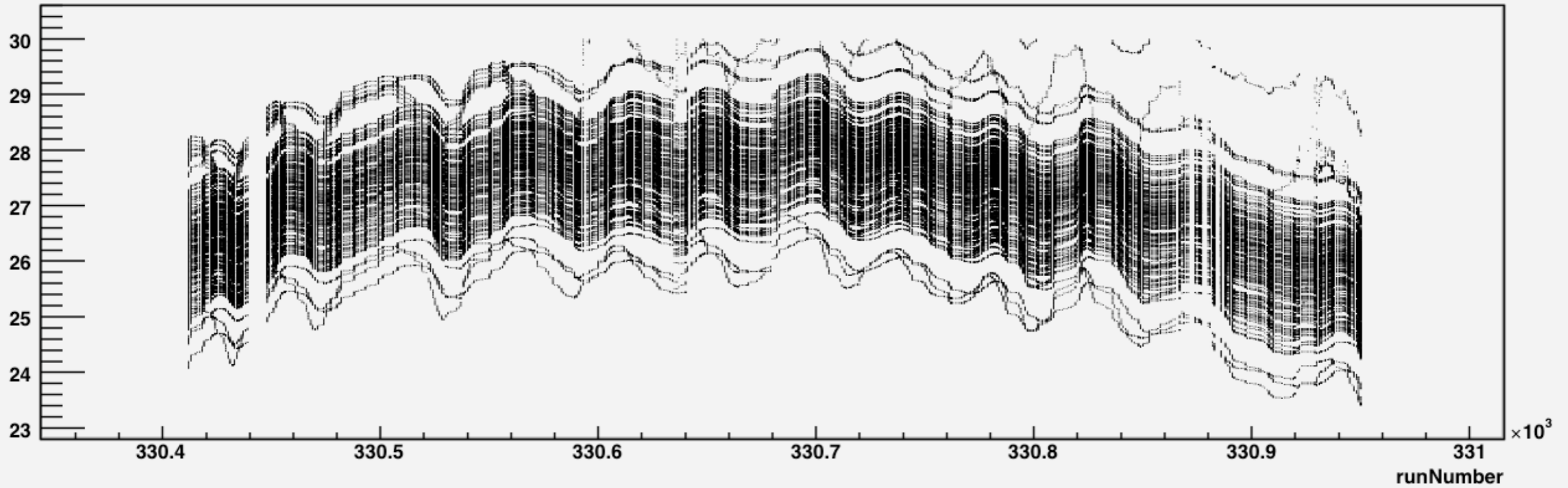
Shaojun Lu
shlu@mppmu.mpg.de

Energy distribution of tiles in track-like cluster



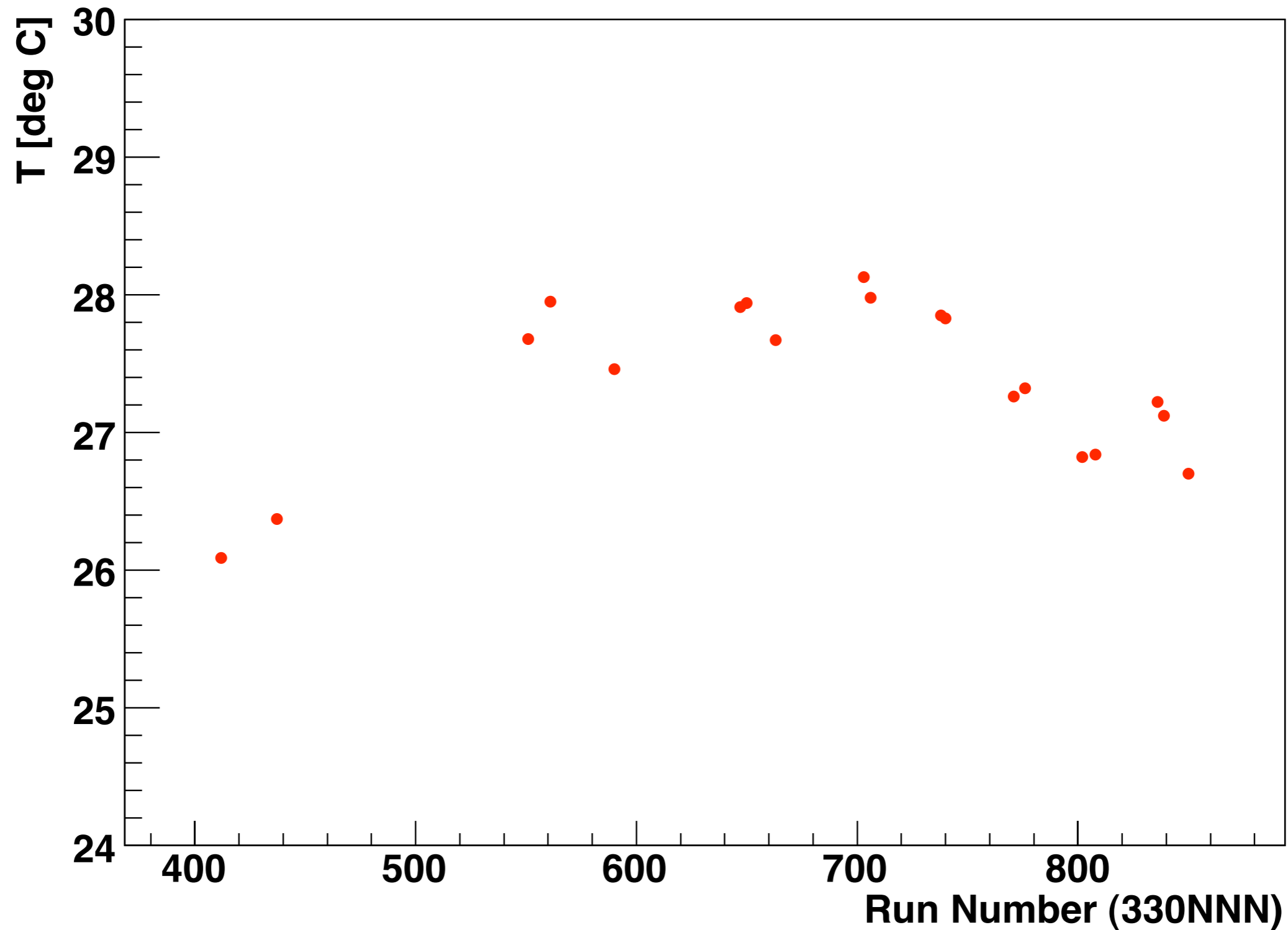
- ✓ Events with track-like cluster
- ✓ Minimum of 10 and Maximum of 50 tiles in each cluster
- ✓ eccentricity smaller than 0.2
- ✓ Fitted with exponential background (fitted from 0.4 to 0.6) and sum of exponential and Landau

Temperatures VS Run Number

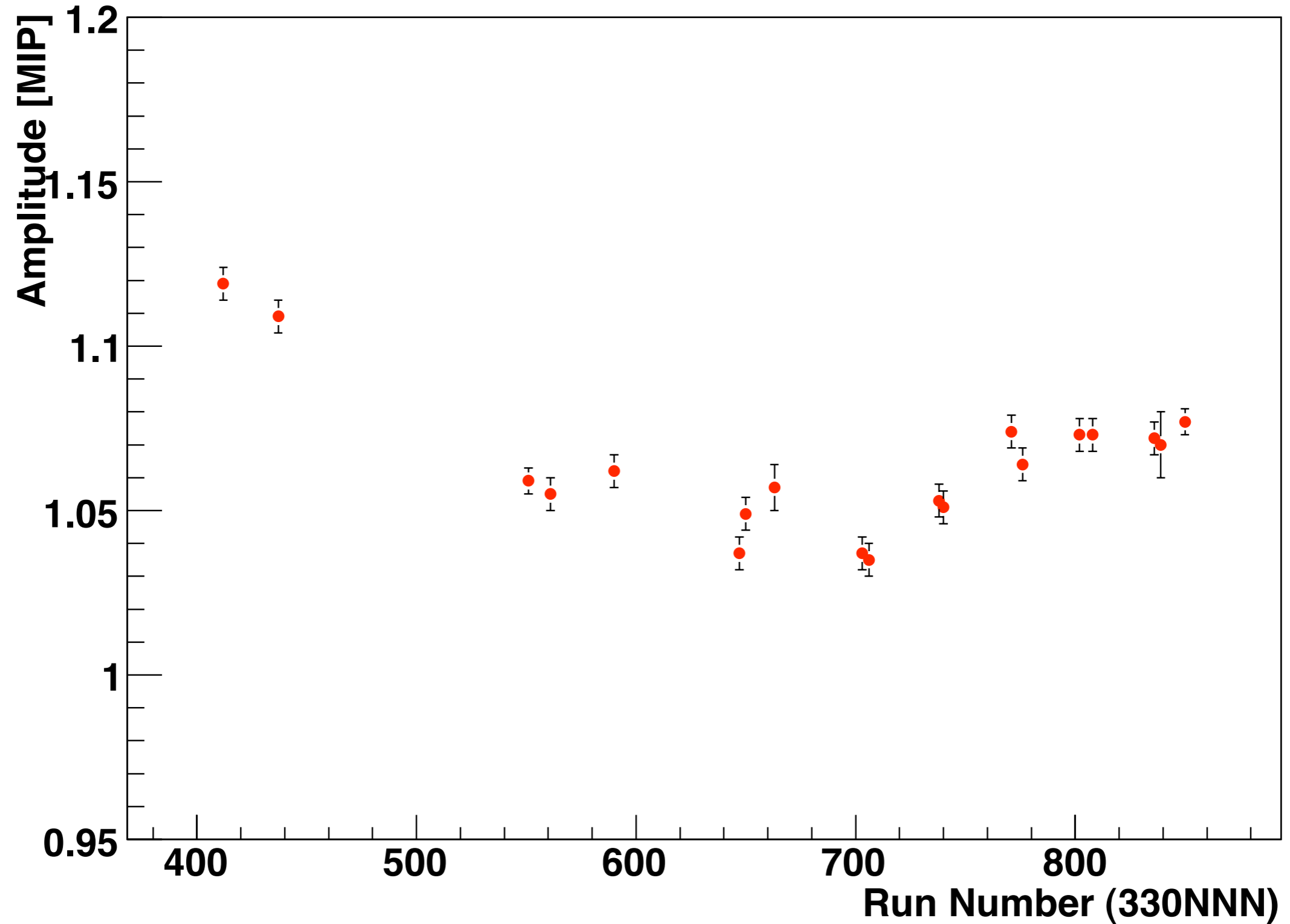


- ✓ This plot shows the Run Number from 330411 to 330960
- ✓ 19 Runs have been studied in this talk.
- ✓ Currently, NO temperature (**measured**) correction has been applied, only the **mean** of all temperature has been used in this study.

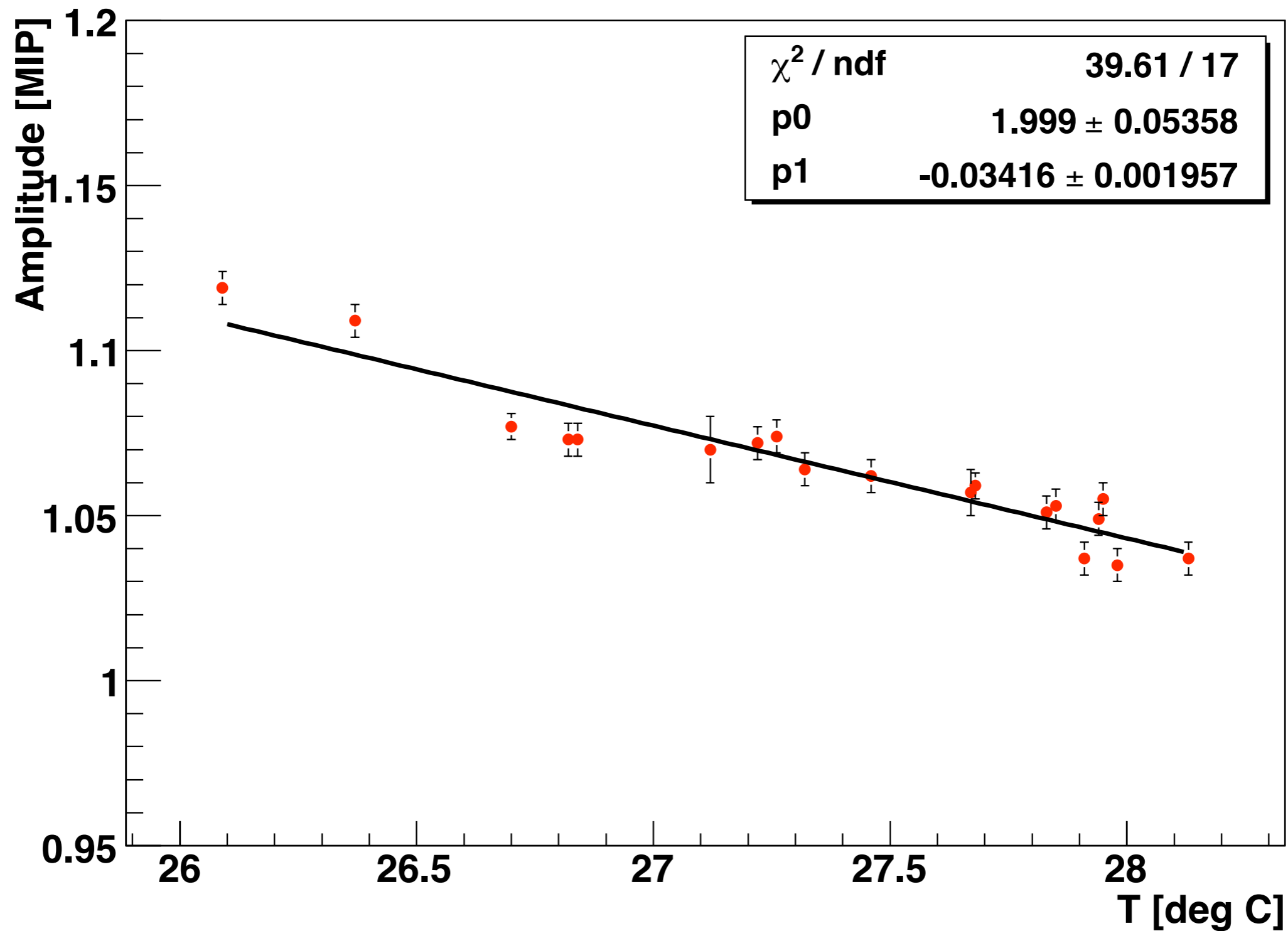
Temperature (mean) VS Run Number



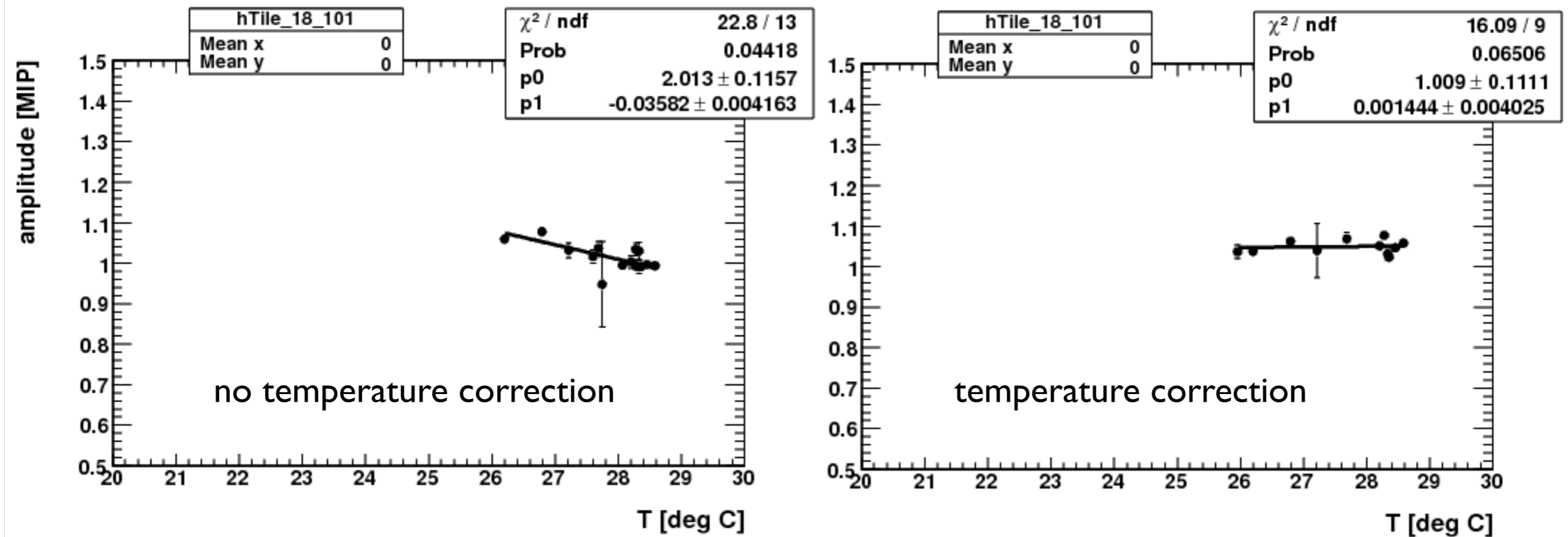
Amplitude VS Run Number



Amplitude VS Temperature



Effects of Temperature Correction



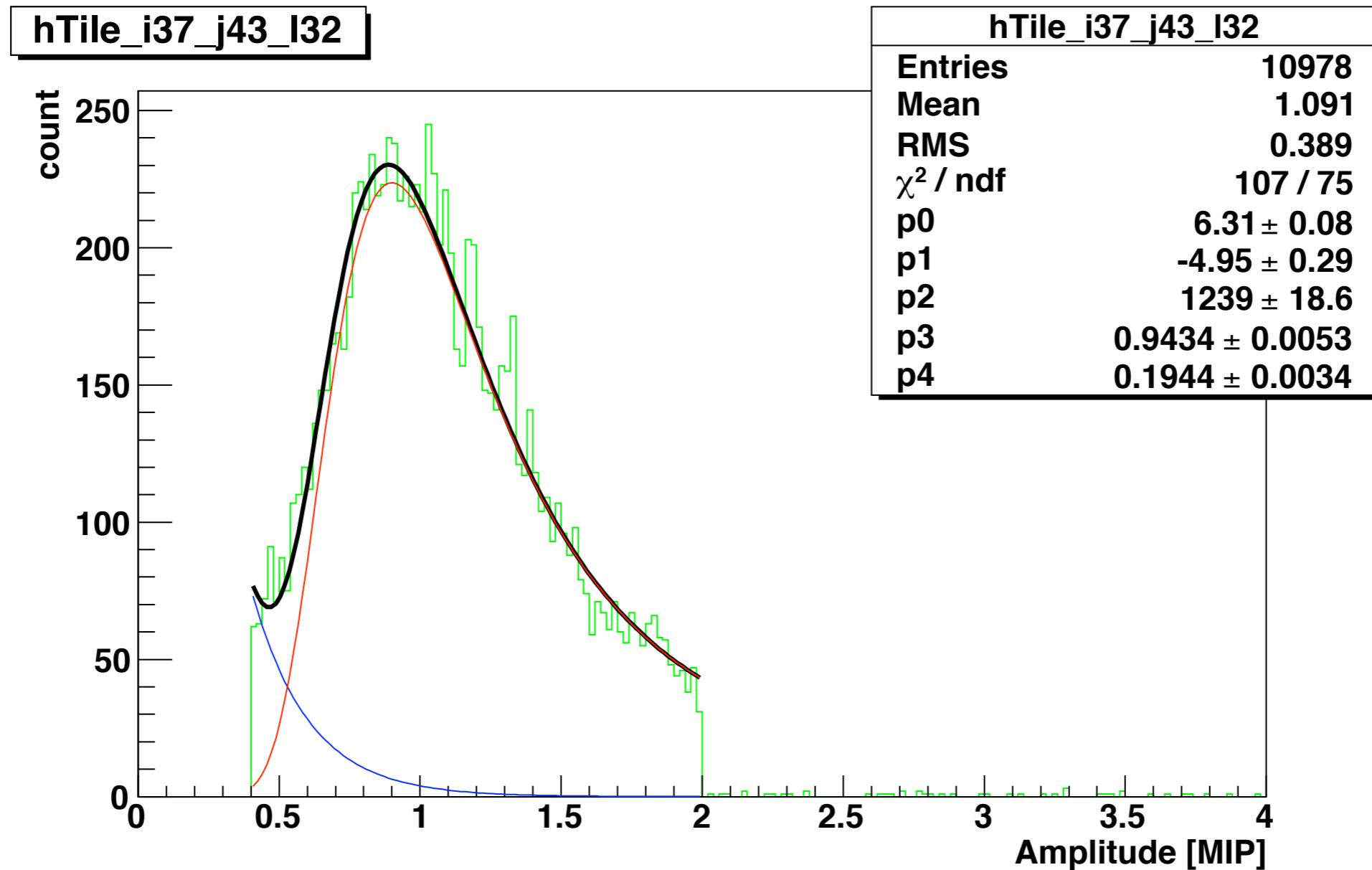
- temperature effect determined from slope of several points taken at different temperature
 - slope consistent with zero for applied temperature correction
 - MIP peak systematically high by a few percent, this is due to the method of calibration used by V. Morgunov

Summary

- The temperature dependence of the SiPM gain has been studied:
 - ➔ in track-like cluster events
 - ➔ with Calice software (DeepAnalysis)
 - ➔ 19 hadron runs are used in this study
- ✓ The clear temperature dependence of the SiPM gain is observed.
- ✓ This study confirms the results of F.Simon's talk on 18,03,2008.

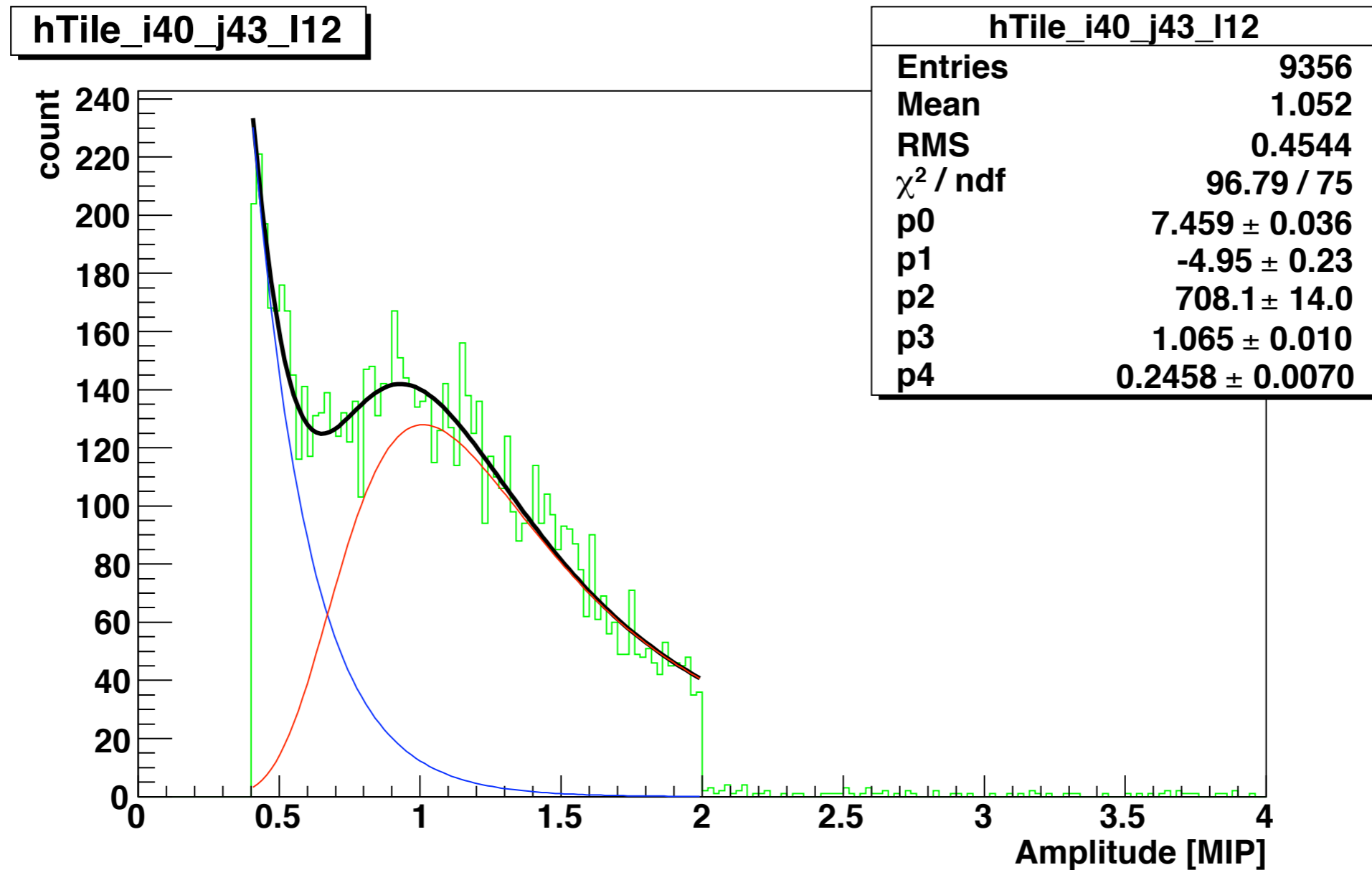
- Thanks Angela and Niels for the help on the Calice software (DeepAnalysis, the steering file and the database servers).

Energy distribution for single tile



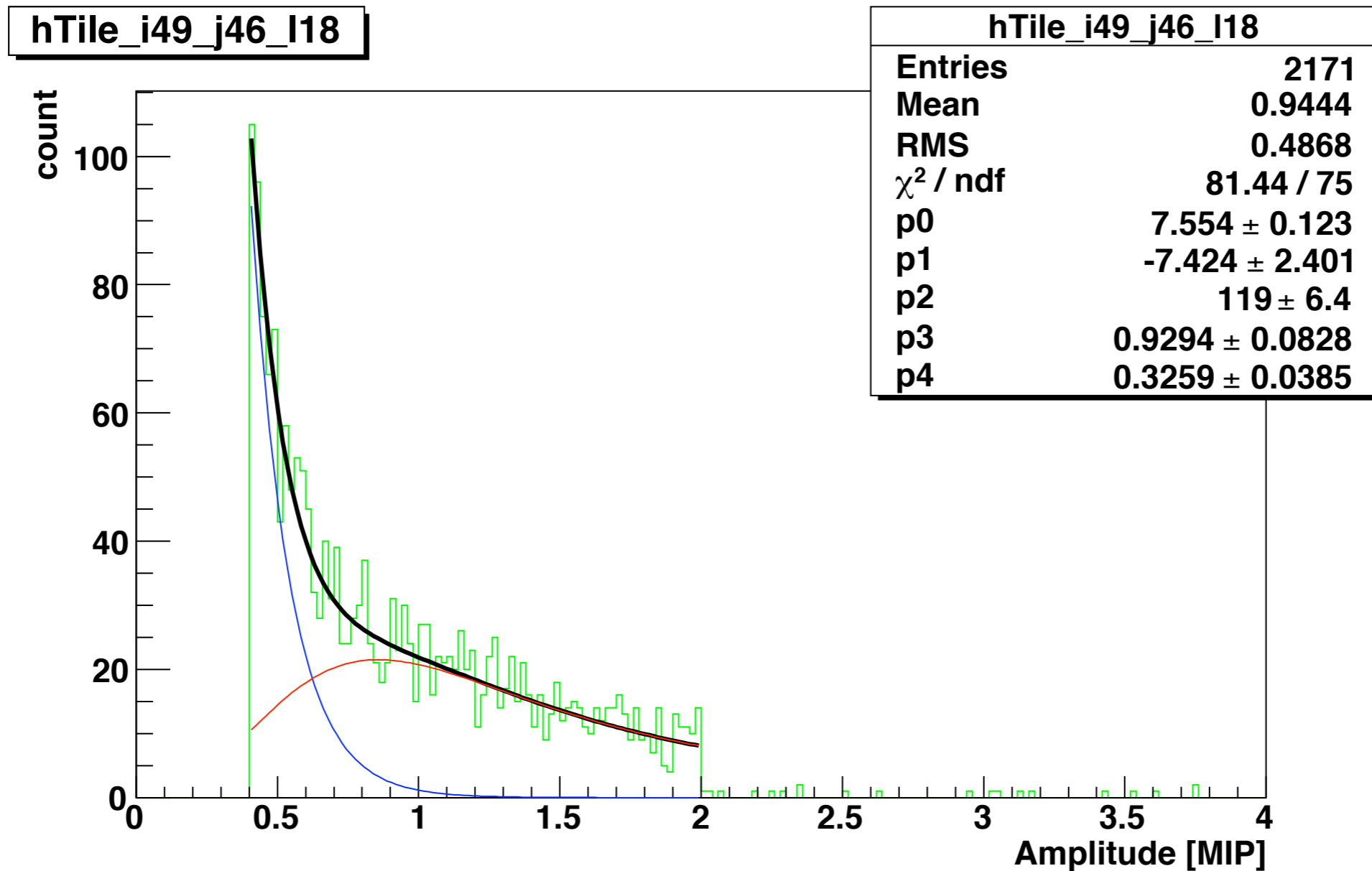
✓ Energy distribution for two selected tiles, fitted with exponential + Landau

Energy distribution for single tile



✓ Energy distribution for two selected tiles, fitted with exponential + Landau

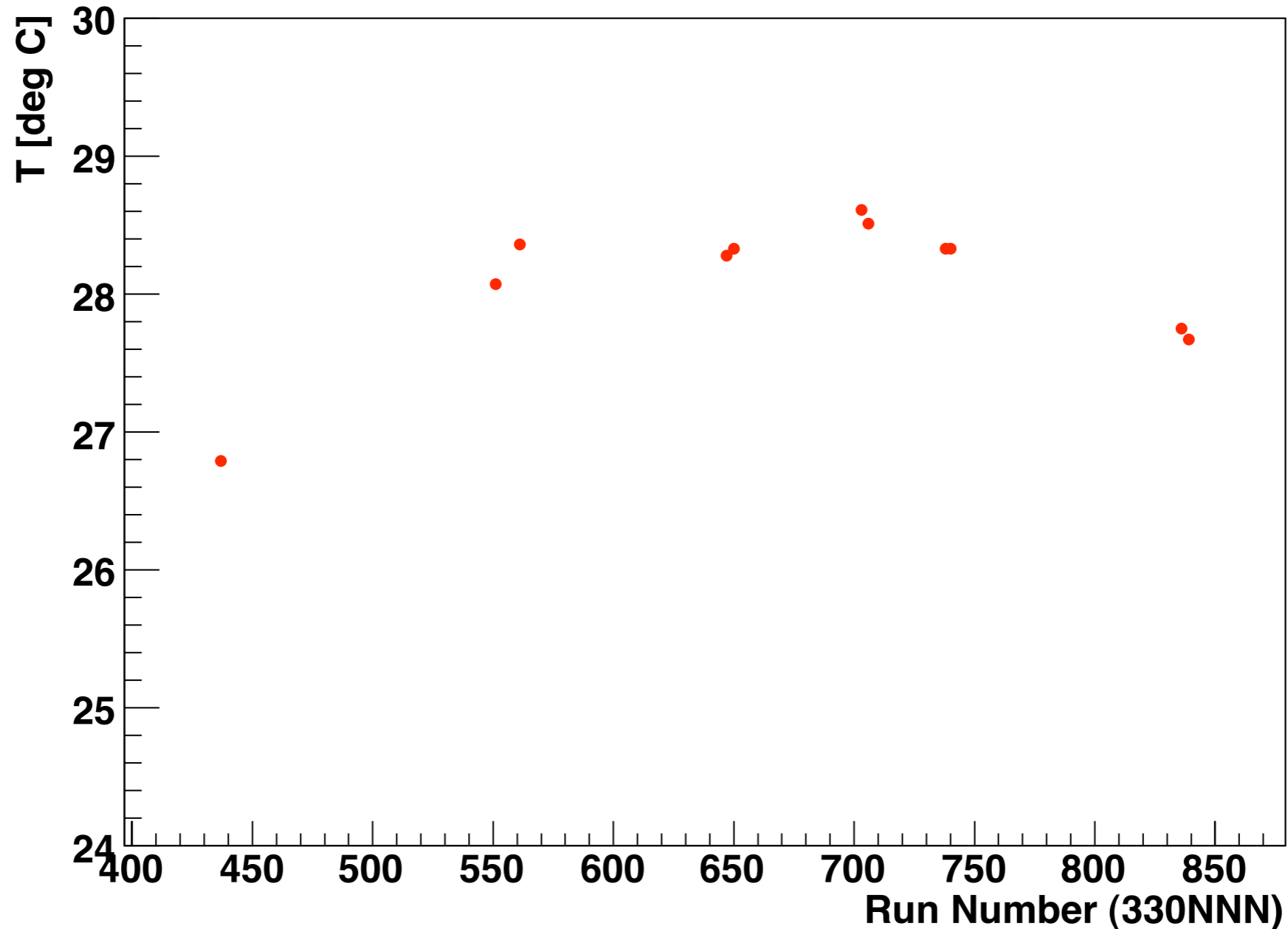
Energy distribution for single tile



✓ Energy distribution for two selected tiles, fitted with exponential + Landau

Temperature VS Run Number

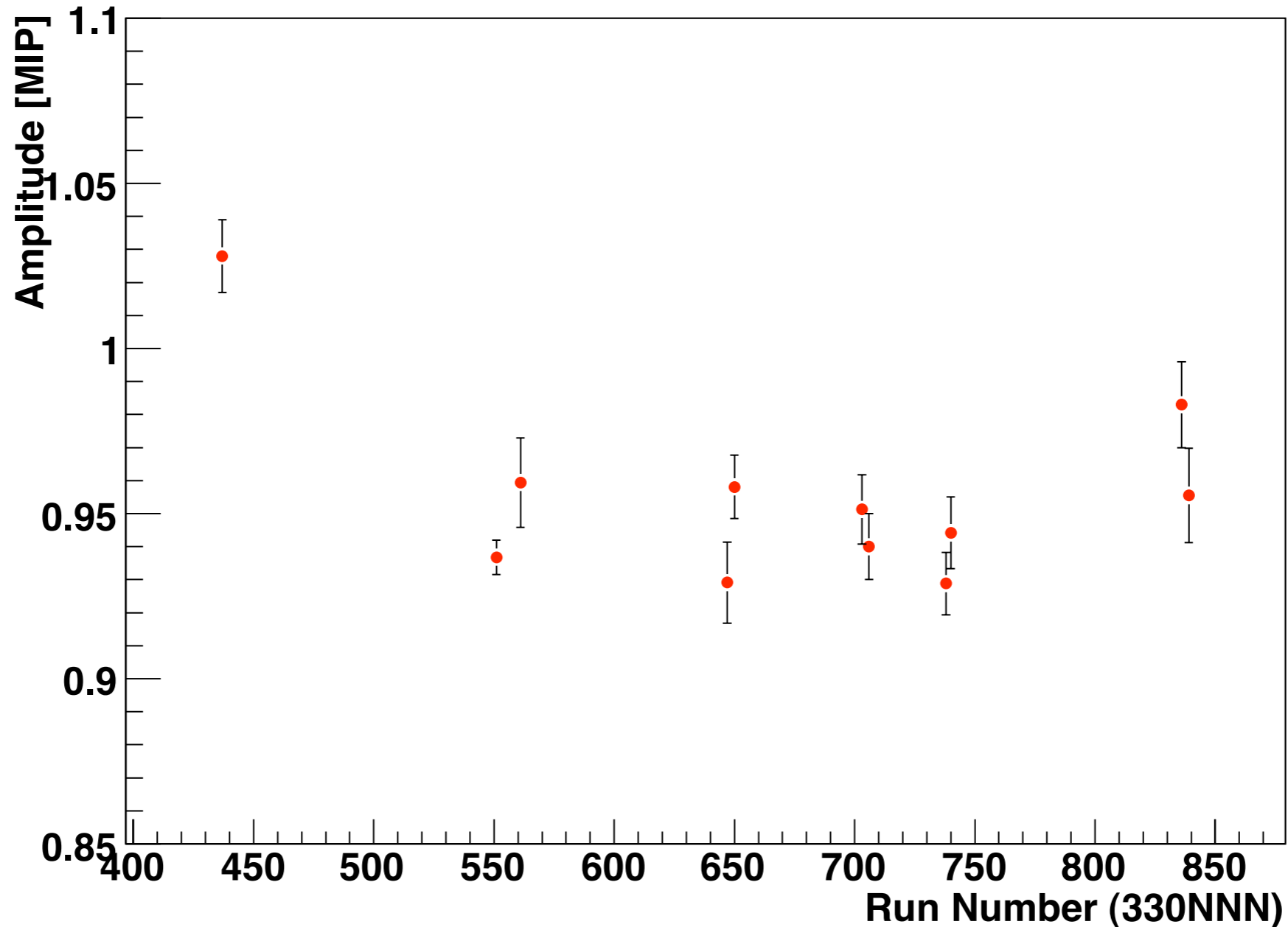
tile (i49_j46_k27)



- ✓ 11 Runs have been studied in this talk.
- ✓ Currently, NO temperature (**measured**) correction has been applied, the temperature from the centre of Layer 28 has been used in this plot.

Amplitude VS Run Number

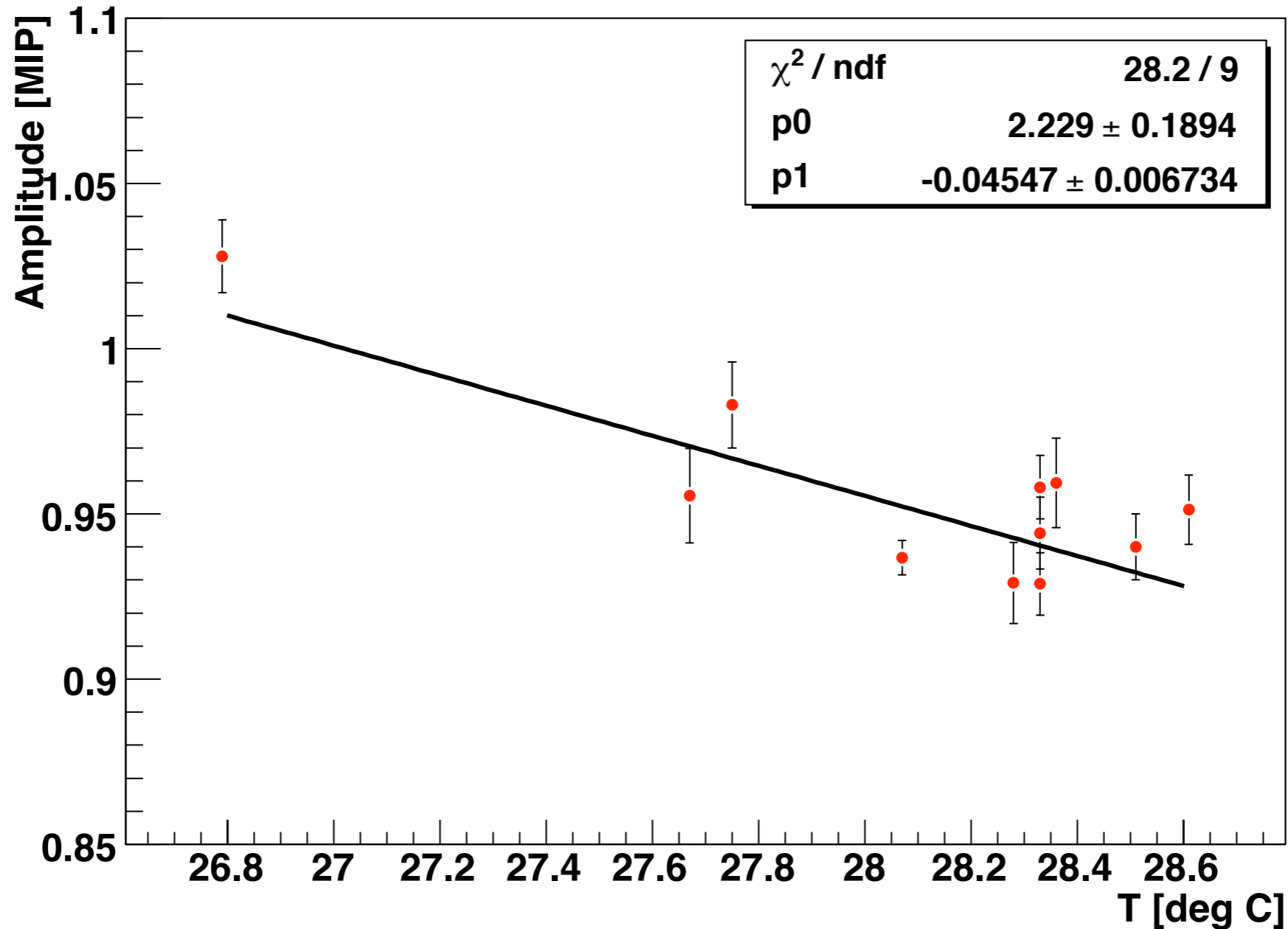
tile (i49_j46_k27)



- ✓ 11 Runs have been studied in this talk.
- ✓ Currently, NO temperature (**measured**) correction has been applied, the temperature from the centre of Layer 28 has been used in this plot.

Amplitude VS Temperature

tile (i49_j46_k27)



- ✓ 11 Runs have been studied in this talk.
- ✓ Currently, NO temperature (**measured**) correction has been applied, the temperature from the centre of Layer 28 has been used in this plot.

Energy distribution of tiles in track-like cluster

