# FMS Update

12 February 2015
Spin PWG Meeting

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# Outline

- Channel Health
- LED Resolutions
- Gain Curves

# Channel Health

- Installed channels: 1237/1264 (761/788 large; 476/476 small)
  - 3 cells to stack (0.2%)
  - 24 bases to be installed (1.9%)
    - 21 new channels + 3 more bases which may need to be replaced
      - (1/3 bases is an old base, but it's an edge cell)
    - 14-20 bases to be installed by next scheduled access (Feb. 18$^{th}$)

- 30 channels missing LEDs (2.4%)
  - Not required to monitor gain for new bases

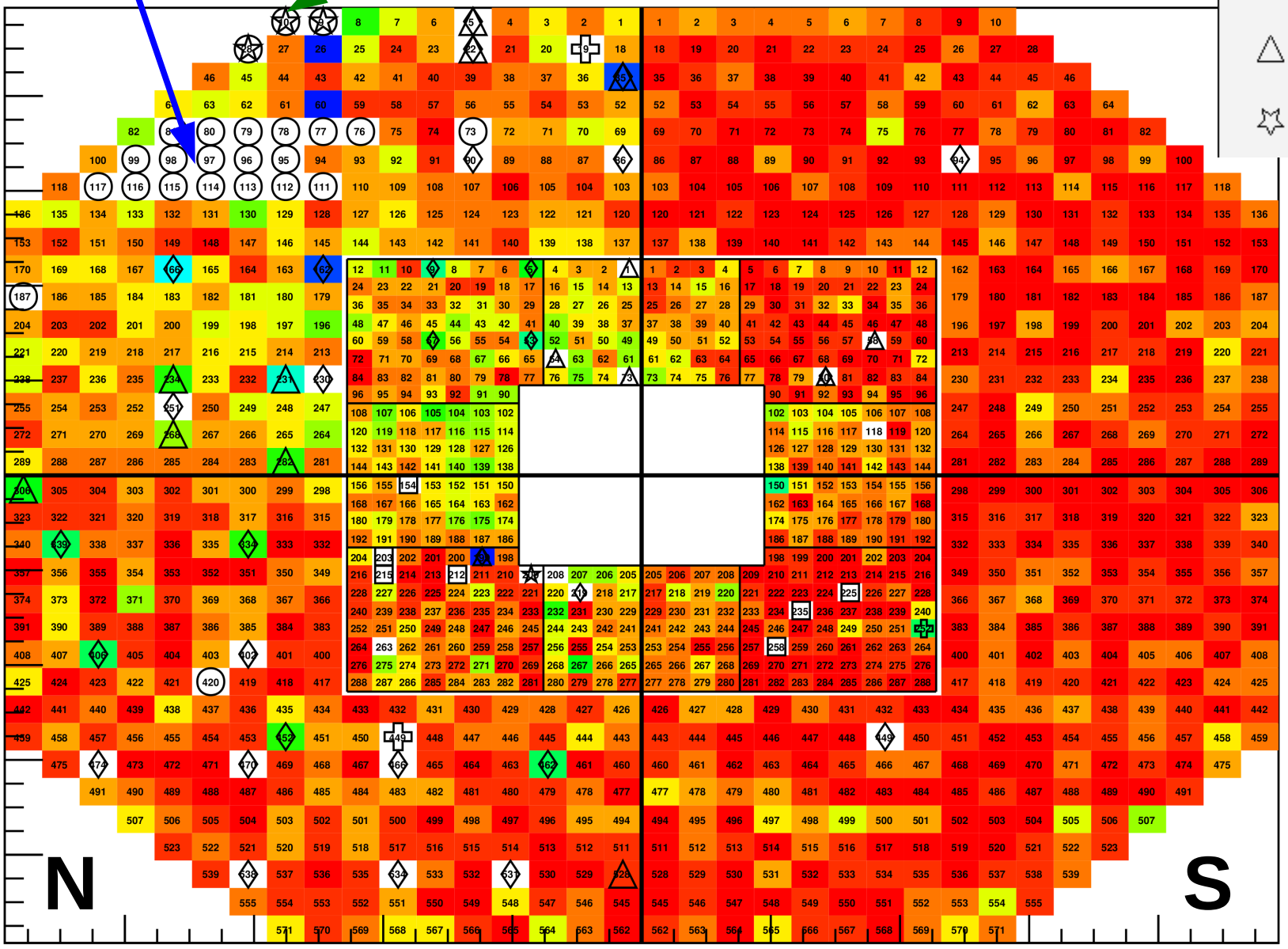
- 3 channels missing signals in QTs (0.2%)

- Other problems:
  - 11-16 small cell problems (2-3% of installed small cells)
  - 3 large cell problems (0.4% of installed large cells)

# Channel Health

18 bases to install

3 cells to stack




◊ no LED

○ needs new base

✚ QT problem

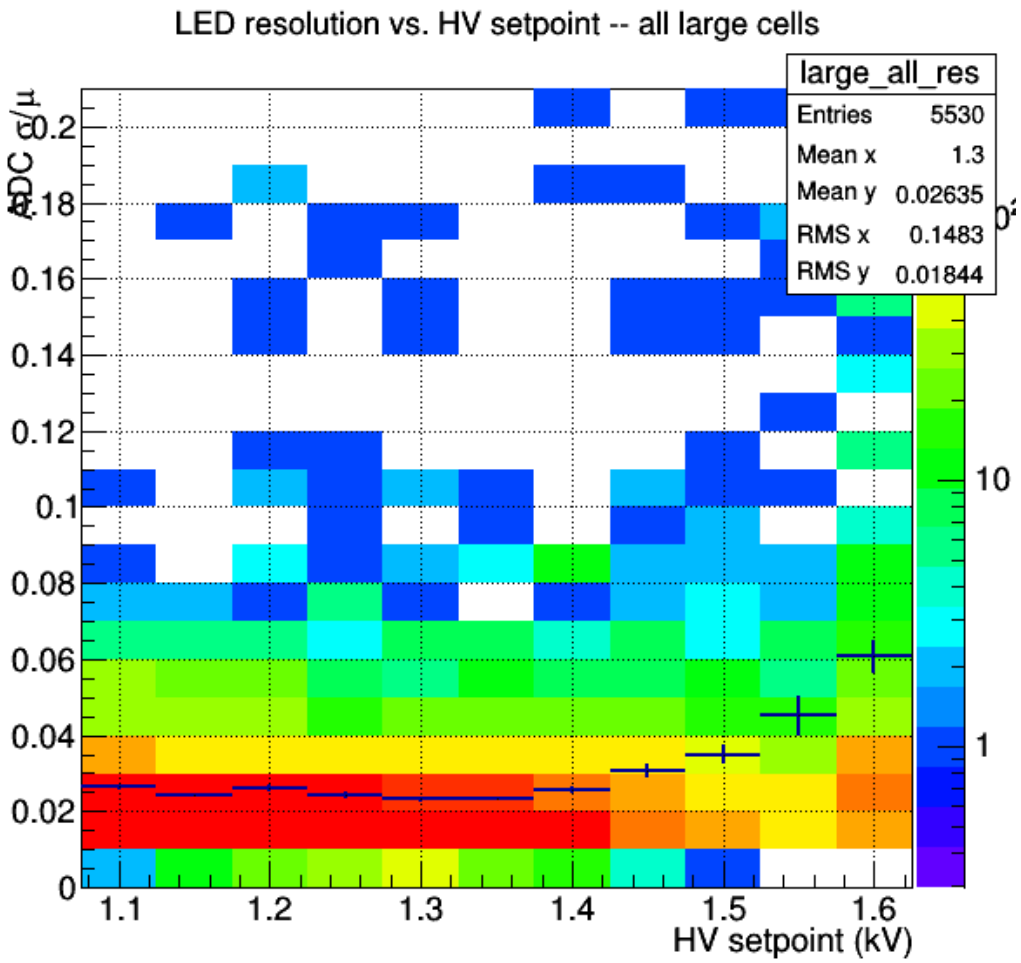
□ bad PMT

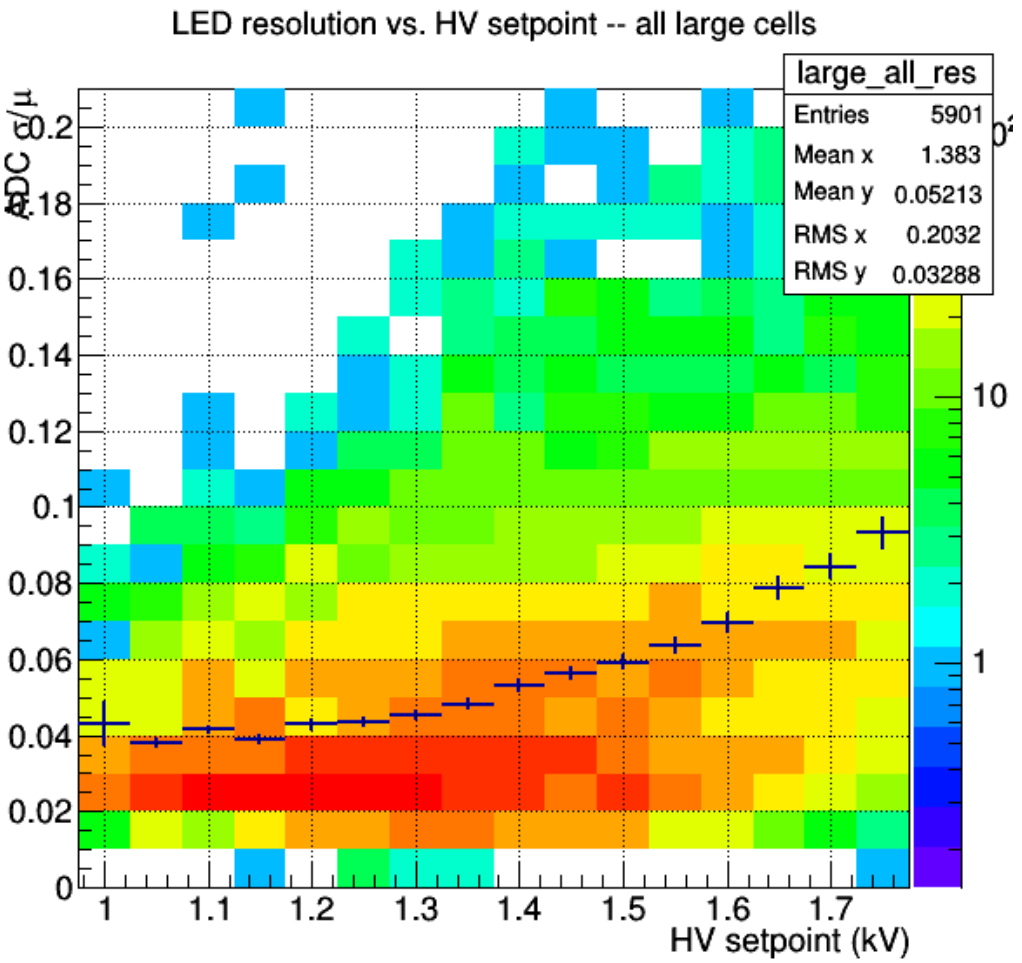
△ low gain

✶ miscellaneous

**Day 37 data at typical HV setpoints**
**Large: -1300V**
**Small: 0xA0**

# LED Resolutions – Large Cells

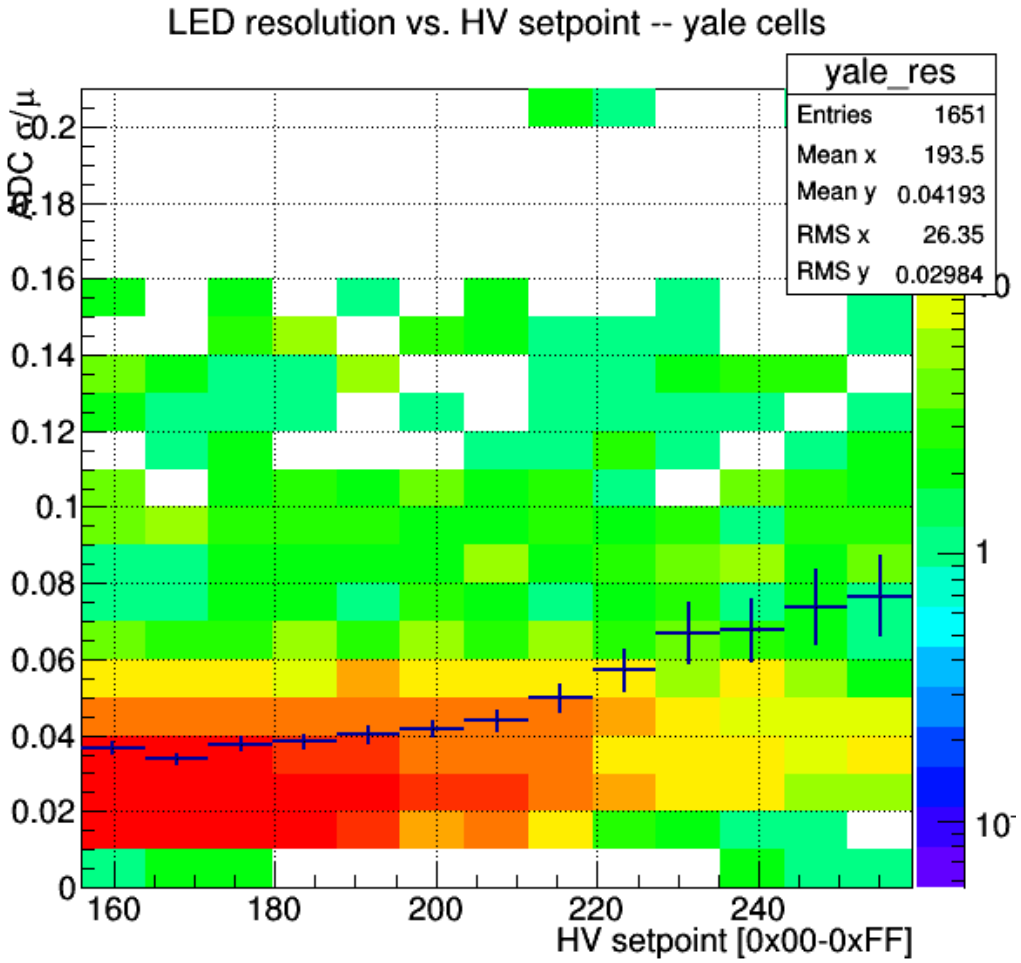


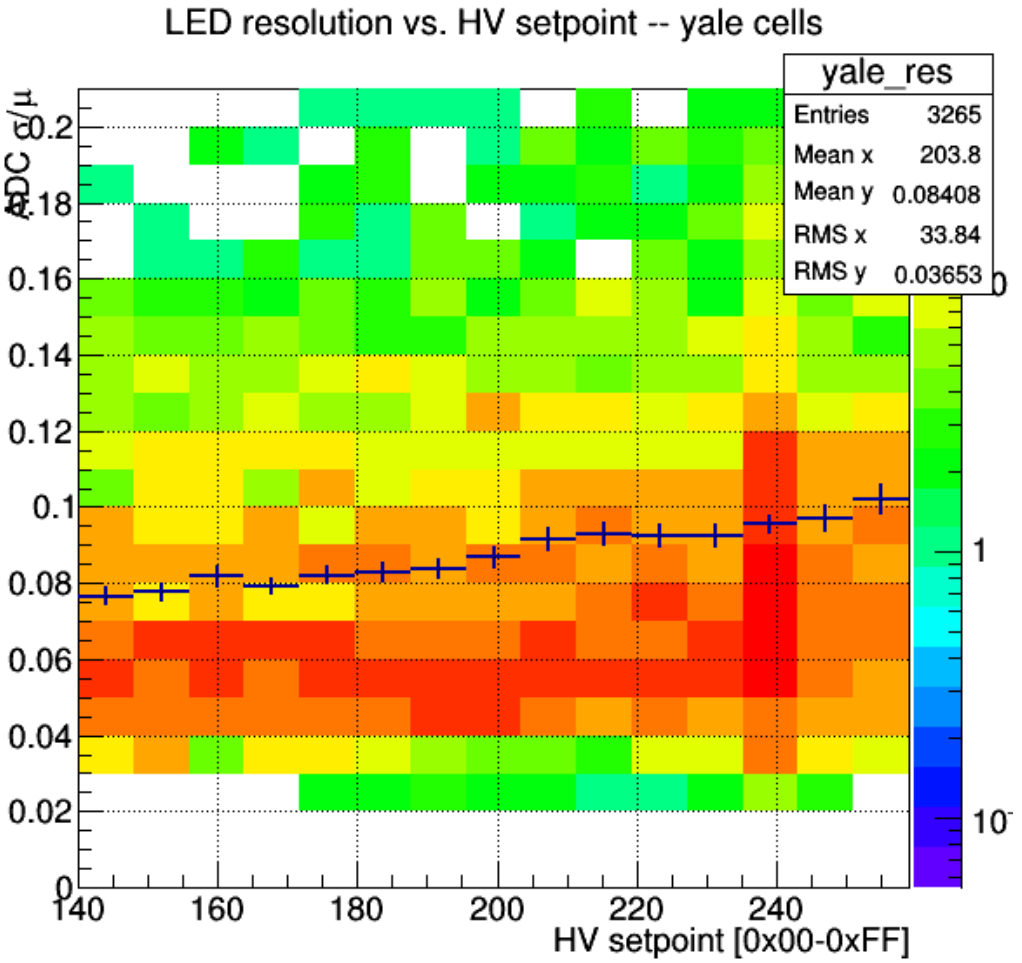




**STAR magnet OFF**
**Day 20**

**STAR magnet ON**
**Day 41**

# LED Resolutions – Small Yale Cells

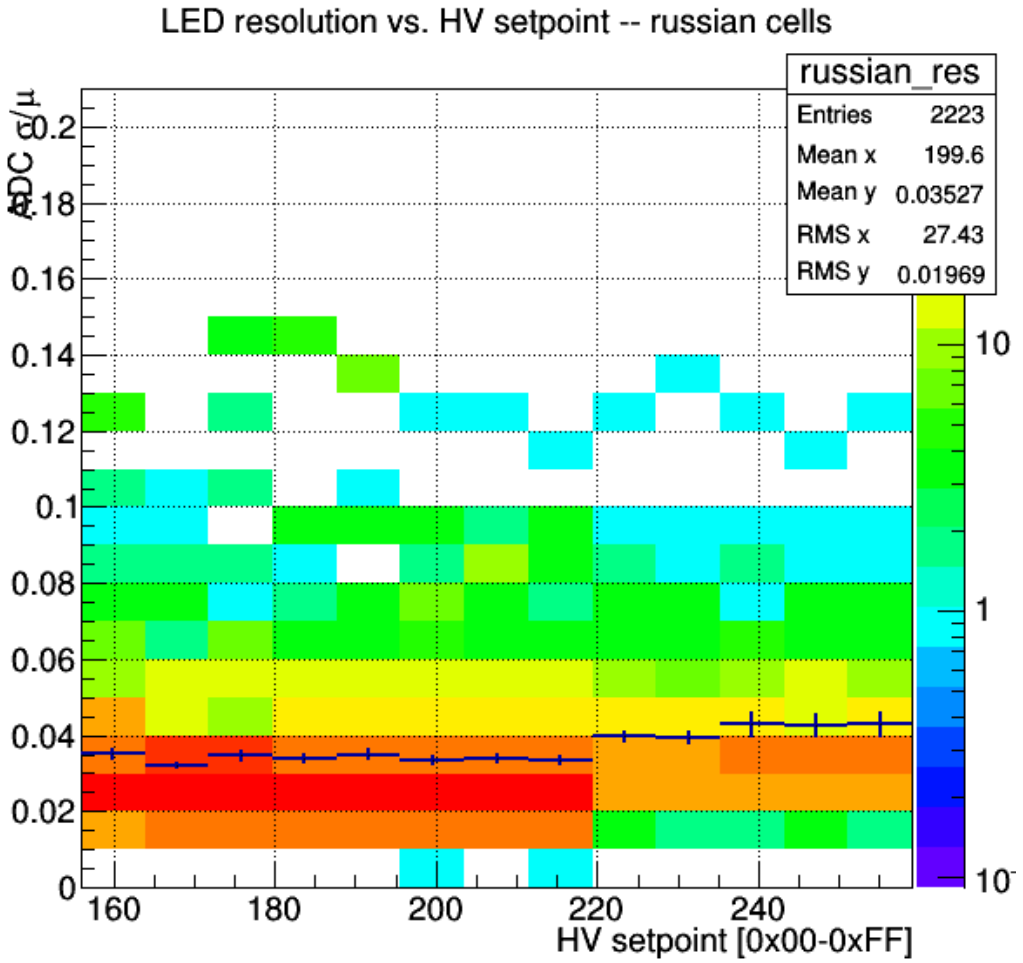


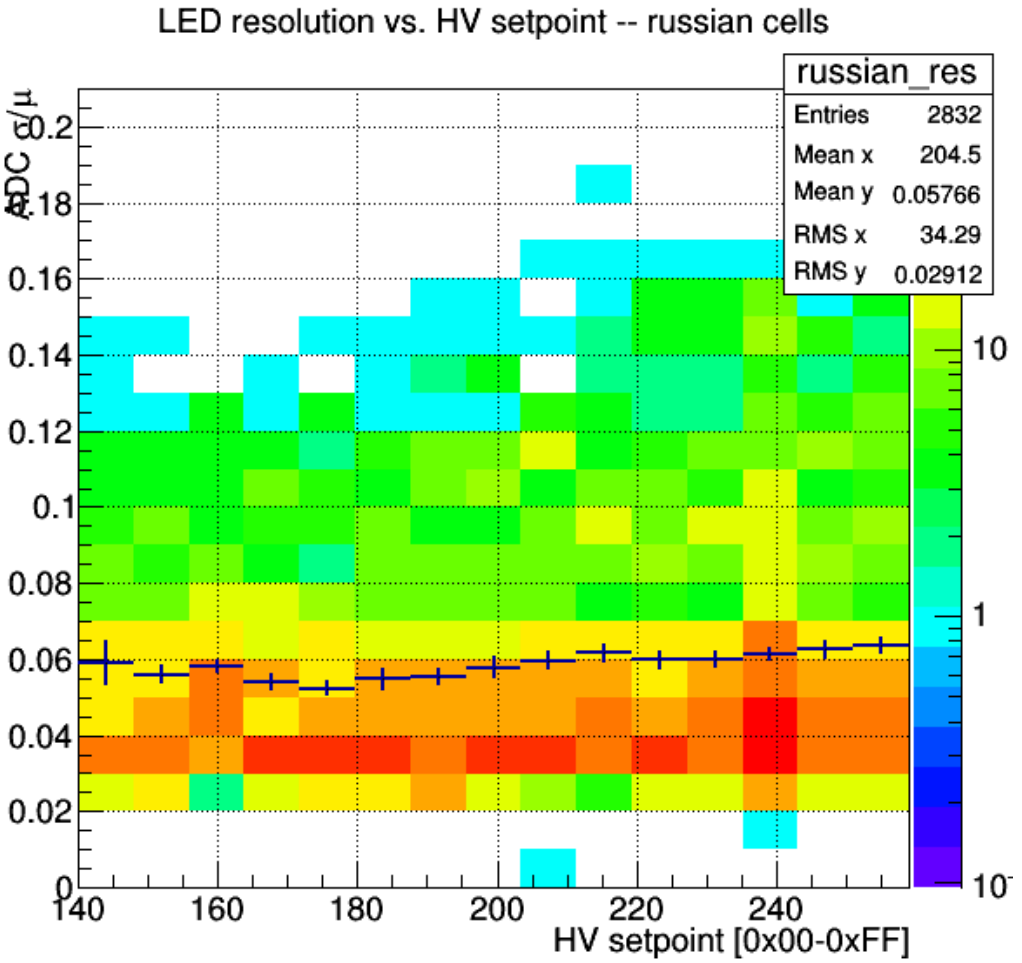




**STAR magnet OFF**
**Day 20**

**STAR magnet ON**
**Day 41**

# LED Resolutions – Small Russian Cells



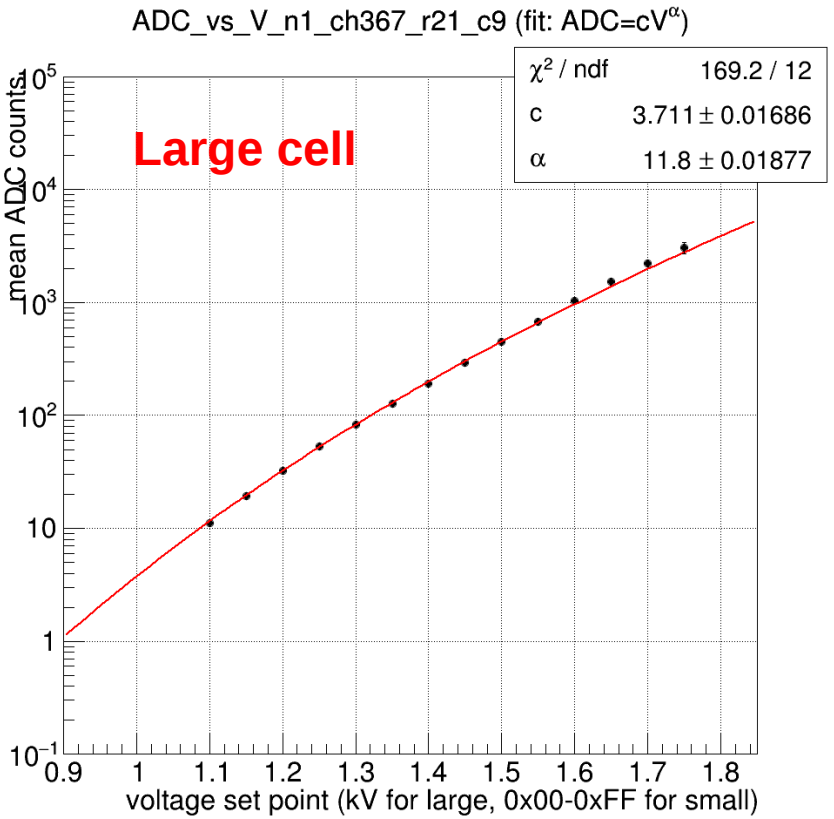



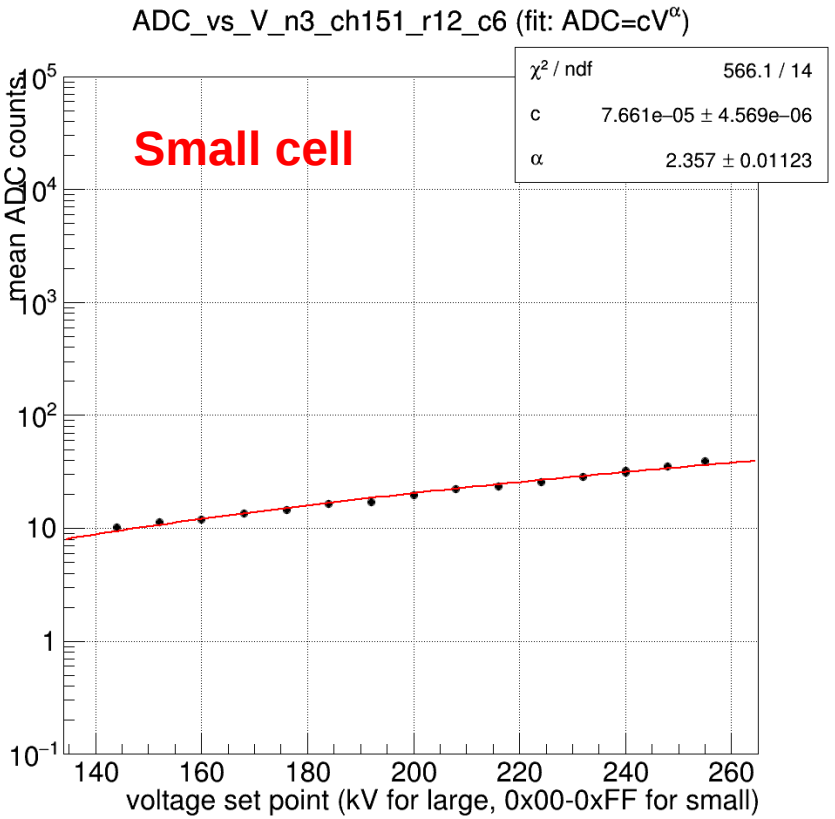

**STAR magnet OFF**
**Day 20**

**STAR magnet ON**
**Day 41**

# Gain Curves

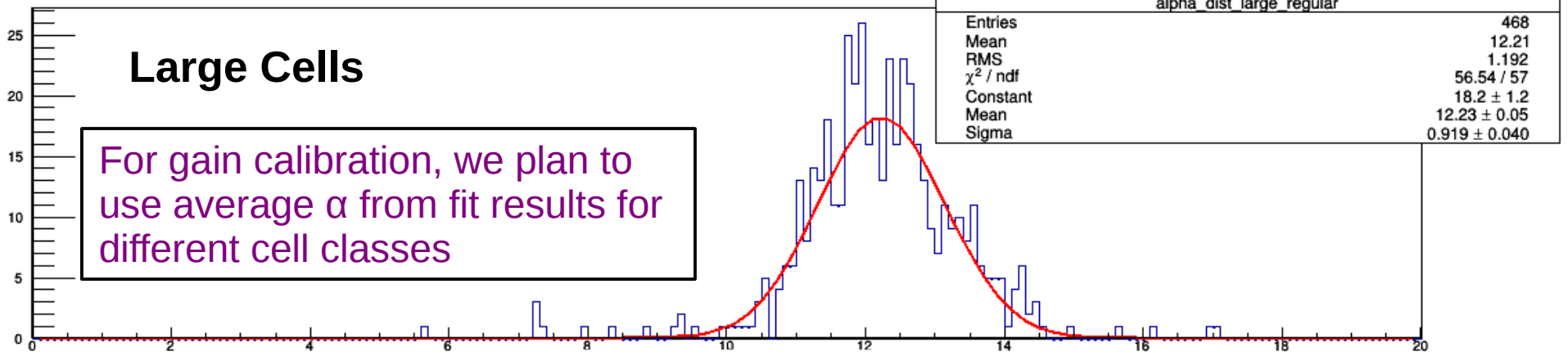
- Day 41 data
  - STAR magnet ON
  - HV setpoint ranges:
    - 1000-1750 V for large cells
    - 0x90-0xFF for small cells
      - (max setting is 0xFF; typical running setting is 0xA0)
  - Fit Function: $\langle \mathrm{ADC} \rangle = c \cdot V^{\alpha}$ (Typical examples shown below)



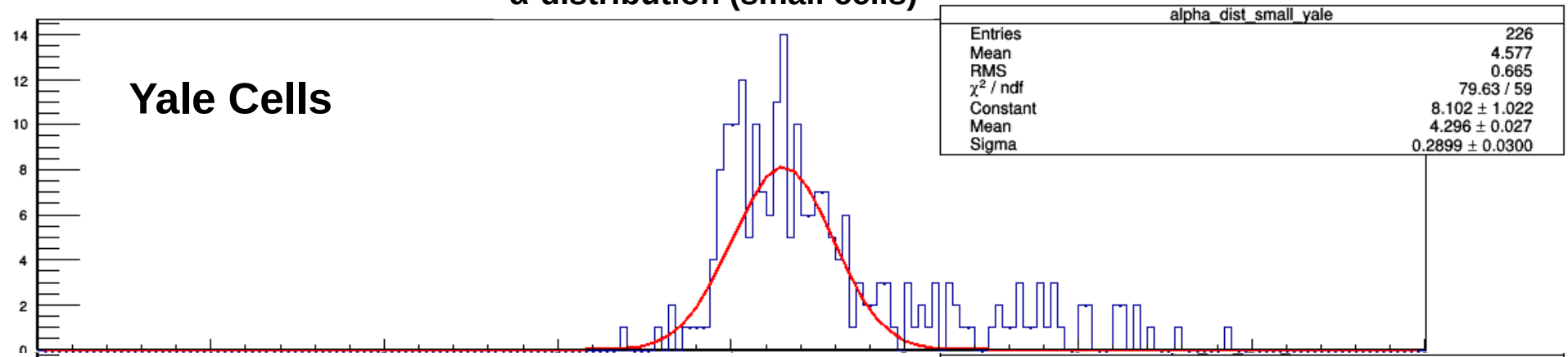
# Gain Curves – α-distributions

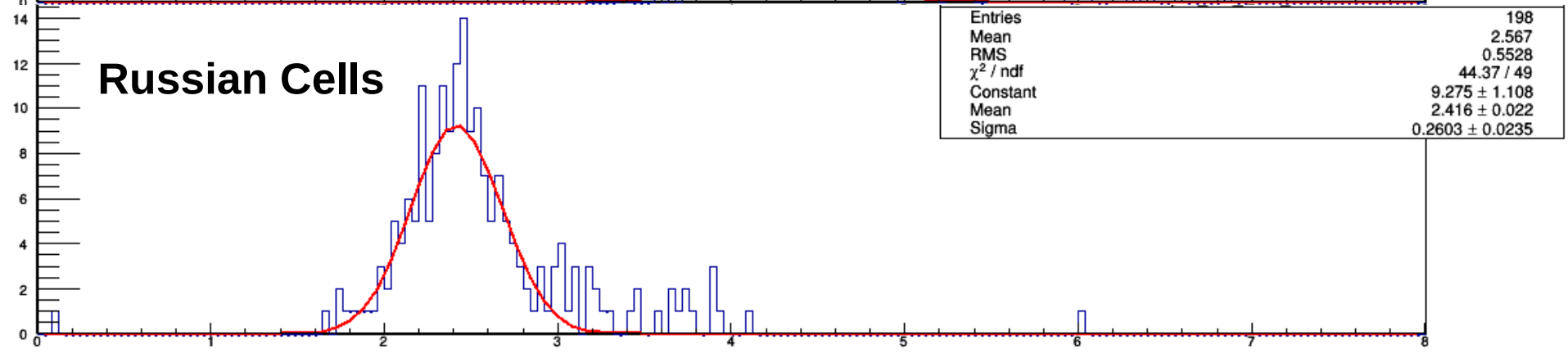
α-distribution (large cells)




For gain calibration, we plan to use average α from fit results for different cell classes

α-distribution (small cells)



# Conclusion

- FMS programming completed by trigger group
- QT timing is now optimized
- PMT gain calibration is currently underway
  - Hardware mapping problems between QTs and FMS to be resolved before taking calibration data
  - New Tier1 file planned to mask disconnected QTs
  - Calibration data to be taken later today