

**SiPM dark rate study update  
Calorimetry meeting 16 Feb 2022**



University  
of Regina



Faculty of  
Science

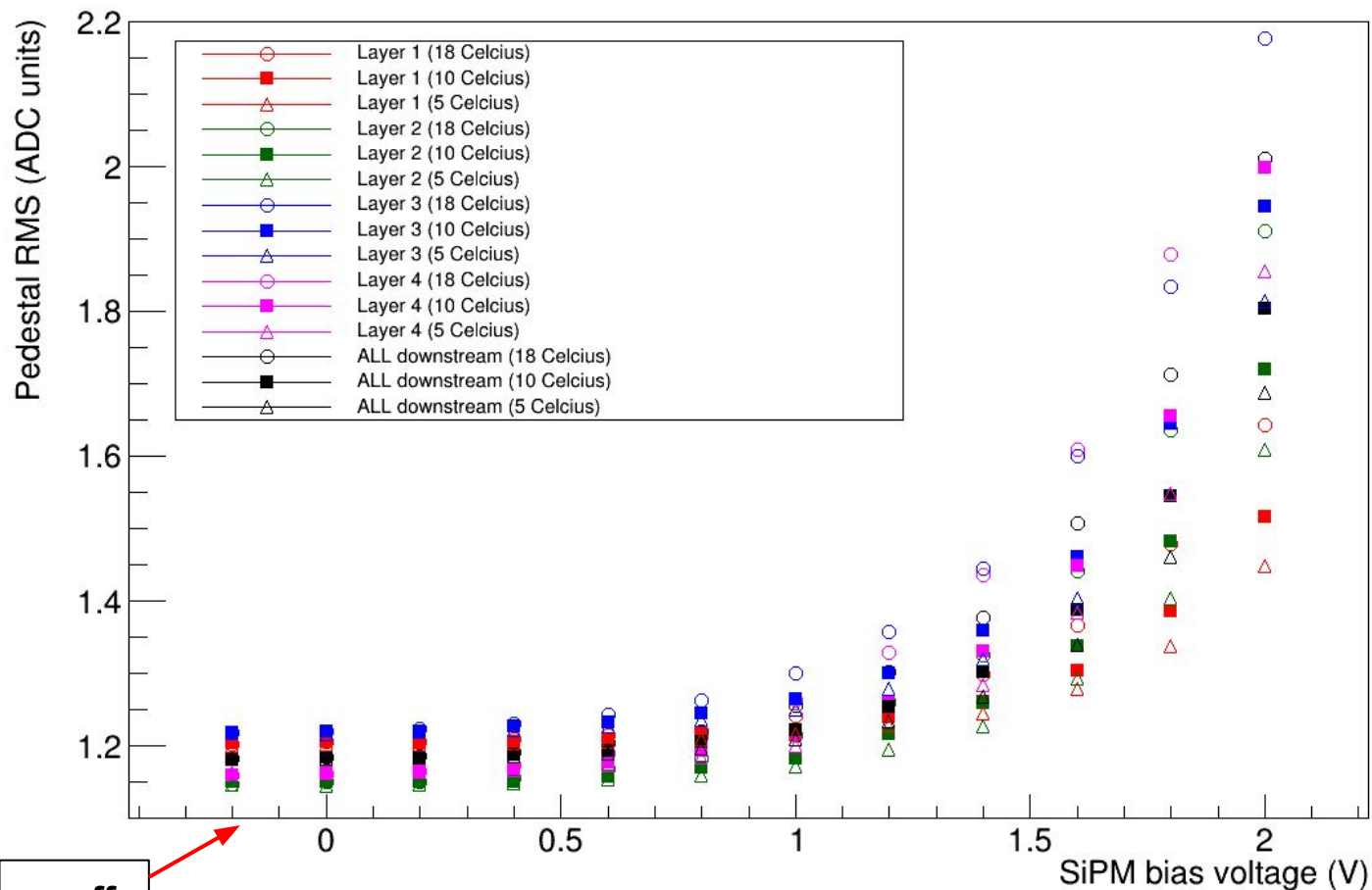
## Dark count rate

- Study dark rate of SiPMs with the help pedestal RMS of fADC
- Higher relative RMS corresponds to more damage
- Studied at different bias voltage (overbias) and temperature

## Data collection/ Procedure

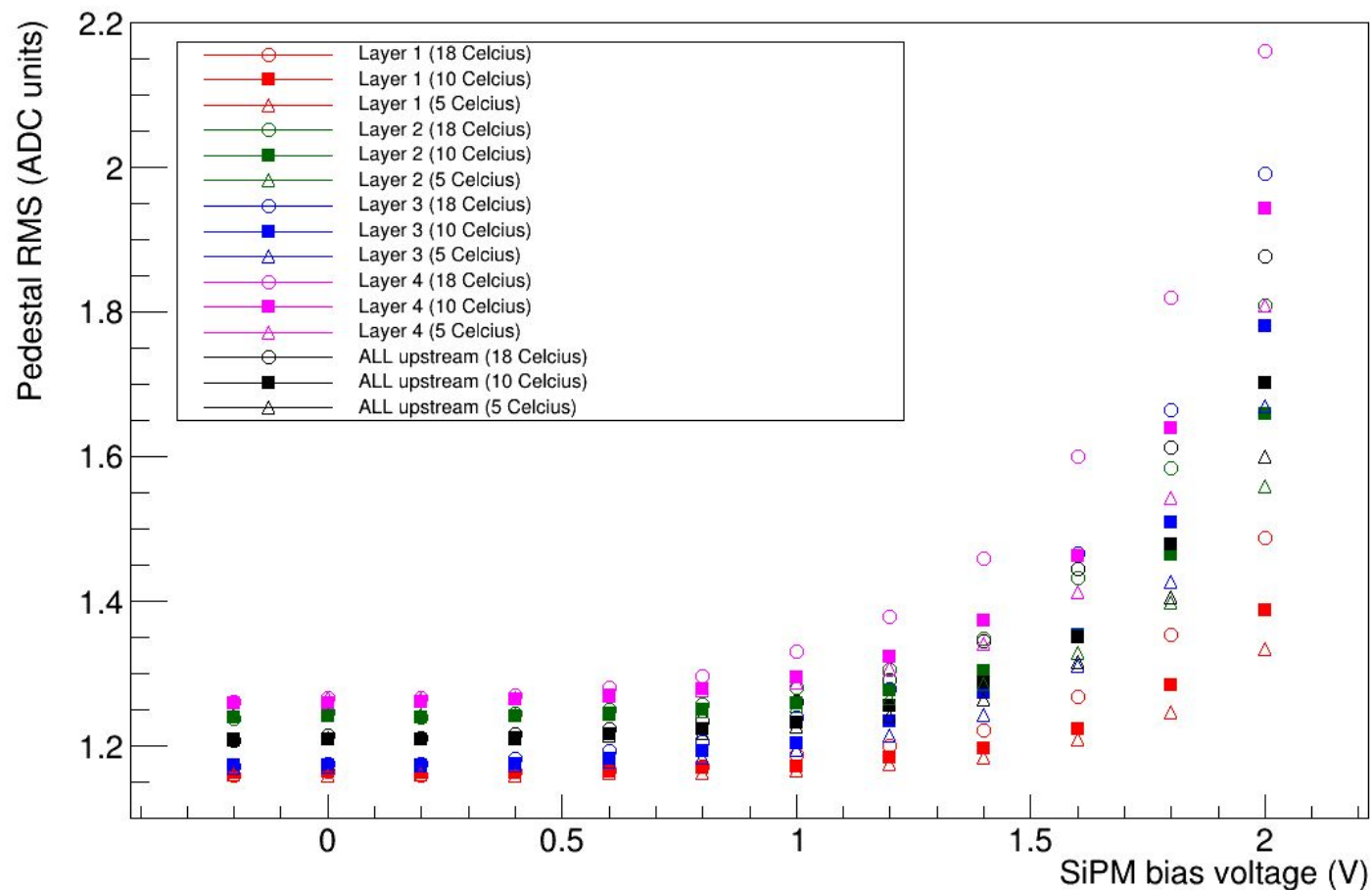
- Quadrant 3 LEDs being pulsed (1000 triggers) with standard 6.25 V setting,
- Different temperatures (18C, 10C, 5C)
- Different bias voltages (V=off, 0.0, 0.2 ..... 2.0)
- Quadrant 1 channels analysed
- FADC\_mode10\_pedestal plugin

# Downstream Pedestal Width 2021

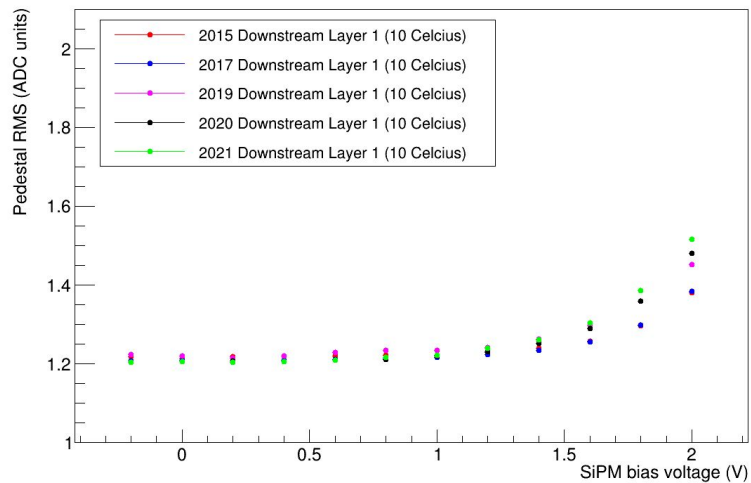


v= off

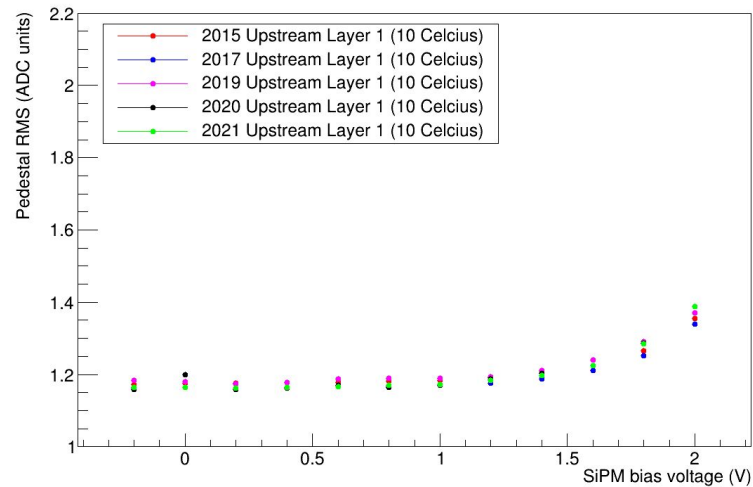
# Upstream Pedestal Width 2021



Downstream Pedestal RMS, Layer 1 10C

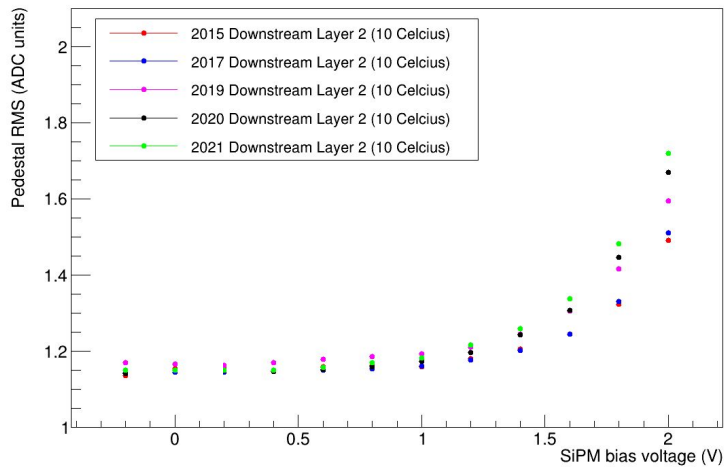


Upstream Pedestal RMS, Layer 1 10C

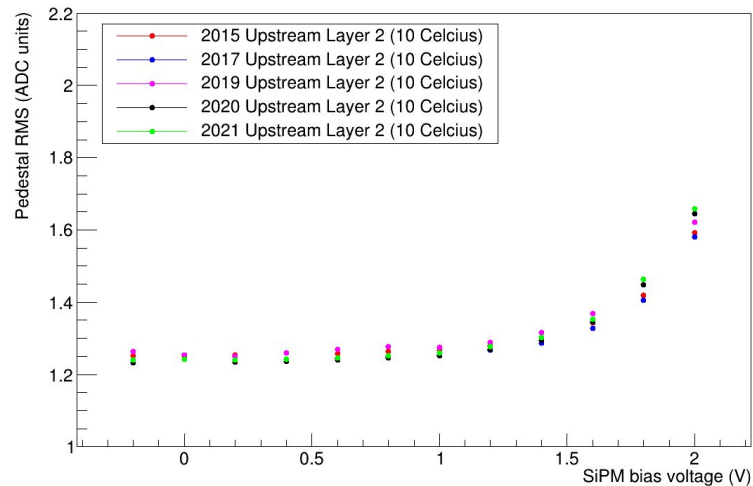


DN &gt; UP

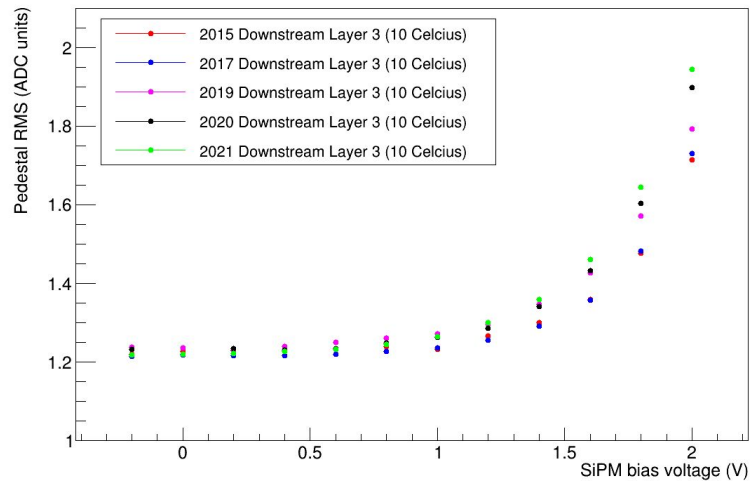
Downstream Pedestal RMS, Layer 2 10C



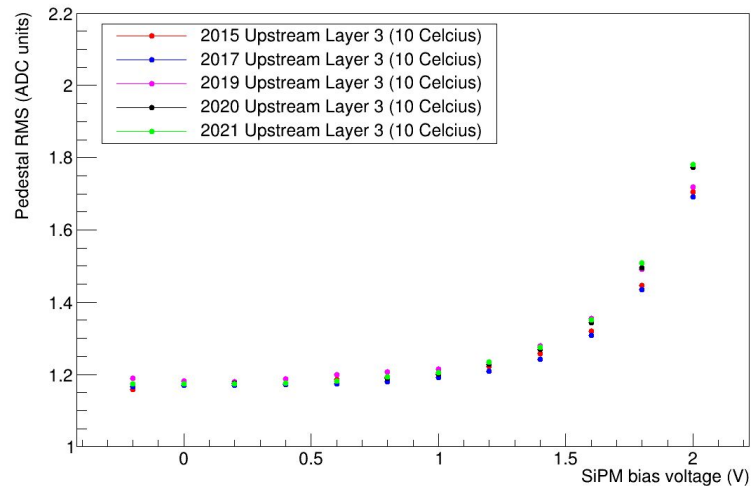
Upstream Pedestal RMS, Layer 2 10C



Downstream Pedestal RMS, Layer 3 10C

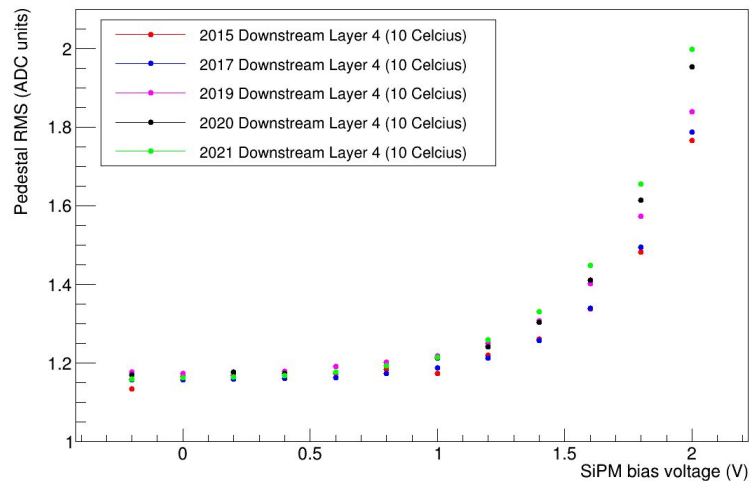


Upstream Pedestal RMS, Layer 3 10C

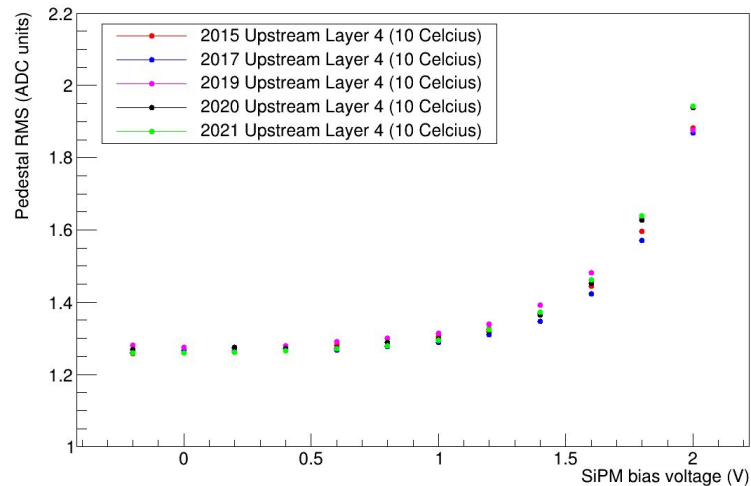


DN &gt; UP

Downstream Pedestal RMS, Layer 4 10C



Upstream Pedestal RMS, Layer 4 10C



## Conclusions:

- Checked SiPM dark rate for 2021 runs- looks ok
- Steady but small increase over time
- Study it in detail with single channels instead of layerwise
- Repeat the procedure by taking runs in 2022