

## Dark offset

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Monday, 23 August 2010 14:33 - Last Updated Tuesday, 05 October 2010 09:51

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## Dark Offset Voltage

The “dark offset” or “dark voltage” or “dark current” or “the darks” is the baseline reading from the instrument when there is no light. Variability in dark voltages are most always a function of instrument temperature. Dark voltages are almost always small, and dark voltages may be of the opposite polarity from readings in light.

Where  $C_n$  is the scale factor as determined in the calibration lab, the following equation describes the relationship between the output voltage of a reading and the correctly reported value:

$$\text{Value [units]} = \frac{\text{Output [volts]} - \text{Offset [volts]}}{C_n \text{ [volts / units]}}$$

A calibrated 0 value will be reported only when the dark offset voltage is removed before applying the scale factor.

In the example plot below, three conditions are illustrated. In the LuZ340 channel, the offset value is too large and subtracting it results in negative light readings. In contrast, the LuZ395 example shows a dark offset that is too small and a 0 value is never approached. The trace for LuZ380 shows a proper dark offset. The "bit-shift" behavior at the bottom of the cast is equally distributed on either side of the trend at the bottom of the profile, below which shows only noise.

