Appendix E

Flat fields and dark frames

This document describes how to take flat fields and dark frames.

E.1 Flat field

A flat frame is taken with all pixels evenly lit and not saturated. This is done using a diffusive layer in front of the camera. It can then be processed to correct (flatten) the response of each pixel to the same amount of light. A dark frame taken with the same parameters such as gain and exposure time as the flat frame is needed.

$$Flat_{processed} = Normalize(Flat - Dark_{\text{flat parameters}}, [0 \leq x \leq 1]) \tag{E.1}$$

$$Frame_{corrected} = \frac{Frame - Dark_{\text{frame parameters}}}{Flat_{processed}} \tag{E.2}$$

E.2 Dark frame

A dark frame is taken with the standard parameters for measurements, but with the source blocked. It allows for the removal of the background light level.