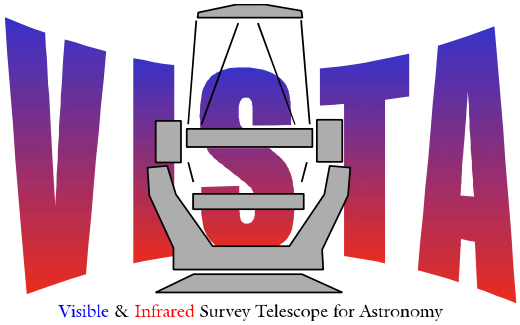

Data Flow System

Document Title: **VDFS Detector Characterisation Tests Specification**

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Change Record

Issue	Date	Sections	Remarks
0.1	2004-12-06	All	Original draft
0.2	2004-12-06	All	Improved formatting & sectioning.

Contents

1 Introduction

This is a list of tests for the Raytheon/VIRGO detectors for VIRCAM that ideally should be accomplished in the laboratory before shipping instrument to Chile. Certain further testing can only be carried out when the instrument is on-sky.

2 Laboratory Tests

2.1 Readout Noise

Determine robust measures of RMS readout noise for each channel.

2.2 Gain

Measure gain in electrons per ADU for each channel, preferably in more than one location.

2.3 Full Well Capacity

Determine saturation limit for each channel for large scale illumination and for "point-like" sources.

2.4 Systematic Pattern Noise

Quantify level of non-random noise for each channel (e.g. pickup noise, odd-even row/column noise).

2.5 Histograms

Verify ADC quantisation only occurs at 1/2 ADU level for each channel by analysing illuminated frames with large range of levels

2.6 Non-linearity

Use a sequence of constantly illuminated flats to assess linearity of each channel by doing exposure time sequence, possibly also at individual pixel level.

2.7 Dark Frames

Measure dark current and assess stability of dark frames as a function of no. of coadds, and exposure time. Use dark frame sequence to assess spurion rate and hot pixel frequency. How do dark frame properties depend on previous frame(s) illumination level(s).

2.8 Flat Frames

use a temporal sequence to quantify no. and location of bad pixels and QE defect regions. Repeat at intervals to assess bad pixel and QE defect stability, particularly after thermal cycling. Stability of relative pixel QE over whole detector.

2.9 Reset Anomaly

assess stability of and quantify level of reset anomaly in dark frames and in dark-corrected flats

2.10 Cross-talk

Measure the cross-talk between channels and possibly between detectors. Requires some sort of point-like source to be projected on the channels or if present hot-enough pixels. Are crosstalk properties stable?

2.11 Image persistence

The temporal and spatial behaviour of residuals from bright point-like sources and the dependency on no. of resets, reads, time since last exposure.

3 On-Sky testing

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