Dark Current.
Integrations were performed at 4 temperatures and ranging from 1 to 1800 seconds. Measurements were made by subtracting the reset frame and taking a median average for each quadrant. The slope of the signal is not linear at low integration times (< 60 sec) suggesting that timing errors are predominant at in this area. However, the slope with respect to each quadrant is consistent which re-enforces confidence that real dark current can be measured as the slope of the linear area. The table below lists the results so obtained.

Temperature	Dark current Rate	Data files
82.8K	~4.36 e-/sec/pix	Dk1*.fit
80.5K	~4.16 e-/sec/pix	Dk2*.fit
79.4K	~5.04 e-/sec/pix	Dk3*.fit ?- noise -?
78.5K	~3.44 e-/sec/pix	Dk4*.fit

Software handshaking.
During the process of detector optimisation it was necessary to modify the clock code that sequences the detector readout. This has the effect of reducing the time spent by the SDSU in processing readout commands. However, the program ‘sdsumndr’ used to acquire data from the SDSU is apparently very sensitive to timing changes of this nature and so limits the extent to which changes in the SDSU timing code can be made. After further testing it is obvious that the failure of the host acquisition is due to memory swaps within the host occurring at ‘a bad time’. During normal use of the host with various windows and applications running concurrently, the maximum mndr reads that can sometimes be successfully readout is 4. By logging out of the system and then re-entering with just one window open the maximum one time mndr value is 14 (but only once !).

Bias gradient.
A gradient in bias level occurs when the array is left to integrate for long periods or is first switched on. This gradient is in the Row direction starting with a maximum at row 1 and having an extent of up to 100 rows in each quadrant. DJI implemented a skeleton scheme to reduce this called flushing. This has now been optimised to include flushing in the post reset and post integration readouts. The optimum flush value is 64 which enables 128 rows to be processed and spurious charge removed before data readout takes place.

Noise.
The readout scheme itself has undergone changes in structure and timing. The optimum scheme now gives a value of 6.5 ADU RMS in areas not contaminated by hot pixels. This value is obtained with a mndr value of 1. By using increasing values of mndr the noise floor decreases to 1.9 with mndr equal 12. This is very close to the theoretical reduction and confirms first order white (readout) noise dominance in the system.

Gain

Linearity

Remenance

Cross Talk

Amplifier Glow.