

!!! Development Idea !!!

Title

Noise Free CCD Detectors !

Summary

With currently available commercial technology, a CCD detector signal can be processed to be virtually “readout noise” free. This is accomplished by oversampling the lumped electronic noise component of the detector system after analogue signal conditioning (detector + system) and using a decimation filter to reduce this noise component to a sub electron equivalent level.

Advantages

- ?? Zero system noise i.e. every converted photon from the detector is conserved.
- ?? Readout speed not compromised by noise increase i.e. detector readout speed only limited by CTE and detector amp gain rolloff.
- ?? 18 bit intermediate conversion product with 256K e- dynamic range at 1e-/adu.
- ?? 16 bit final conversion product gain ranged digitally providing stable and integer gain relationships.
- ?? Reduced analogue signal conditioning resulting in higher system stability in gain and offset, lower susceptibility to induced noise, and reduced part count.
- ?? Can be fitted to existing ING CCD controller systems.

Application

- ?? Improving signal to noise ratio for a given integration on any non sky limited imagery.
- ?? Reducing integration time for a given signal to noise ratio
- ?? Rejuvenating current detector technology by :-
 - Reducing readout time.
 - Reducing readout noise.

methodology

