UCLA Software

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NIRSPEC/NIRC2 Overview

Scripts

KTL Keyword Library

Eavesdrop Gui

Temperature Gui

Rotator Gui

Rotator Server

Detector Control Dataviews GUI

Mechanism Dataviews Gui

Echelle Format Simulator

Scripts

Quicklook GUI

Data Saved To Disk

SCSI to FIBER & Matchbox Hardware

Transputer/Keyword Server

Guider Gui

Dataviews GUI

Guider Gui

Mechanism Dataviews Gui

Temperature Gui

KTL Keyword Library

Root Transputer

Motor Control

PICNIC Control

ALADDIN Control

Housekeeping
Benefits

- Software Exists and is essentially complete.

- Fully integrated with ALADDIN electronics also being fabricated at UCLA.

- Identical to NIRSPEC -> Easier for CARA to maintain.
Benefits

- High level connection with Telescope DCS control program.
- Compatible with all CARA requirements.
- Easily expandable.
Electronics Capabilities

- 4 microsecond pixel rates => 0.131 sec full frame.
- Minimum CDS = 0.25 sec. Coadds require 0.1 sec.
- 5 Electron System Noise.
- Programmable Detector Bias and Preamp Offsets.
ALADDIN Software Capabilities

CURRENTLY:

✦ Three readout modes:
  1. Single Sample after reset (min = 0.25 sec).
  2. Correlated Double Sampling (min = 0.25 sec).
  3. Multiple Fowler Sampling.
✦ Up to 10,000 coadds (0.1 sec overhead).
✦ Frame download requires 5 seconds.
✦ Fits writing and copying requires 1 second.
ALADDIN Software Capabilities

- Display requires less than 1 second.
- Individually set preamp voltage offsets for each detector quadrant.
- Complete Bias Control.
- Variable analog conversion rates.
- Variable electronic filtering.
UCLA Modifications

Subarray Clocking

- Centered square subarrays; multiples of 16 pixels
- Speed Improvements:
  512x512: 35 ms read time.
  256x256: 9 ms read time.
- What’s Involved
  - Arbitrary clocking pattern
  - More complex packet sizes
  - More complex data arrangements
UCLA Modifications

ALADDIN 3 Multiplexer

- Last 6 devices of PAIDAI consortium have different multiplexer.
- Benefit: less odd-even row variations.
- Requires:
  - Overclocking of 2 quadrants.
  - Unscrambling last two rows of other quadrants.
Quicklook

- Full Function IDL Image Display and Analysis Package.

- Supports image arithmetic, photometry, spectral plots, surface plots, image statistics, zooming, Gaussian fitting, etc…

- Forms KIDL connection to server => auto display, display file, move telescope.
Expandability

- Based on KTL server.
  - High Level Scripts.
  - IDL interaction via KIDL.
  - C based GUI with KTL.
  - Full Connectivity to Telescope, AO system, and other KTL servers.
Snapi Script (csh)

#!/bin/csh -f
# Usage: snapi
# Options: none
# Note: uses the node and nodn nirspec keywords for
# nodding. It also copies its last file into
# the /tmp/TEMPSKY2 file so the guider will
# have a fresh sky frame.
# Purpose: Take a scam image at the current position,
# nod away by the amount specified by node ...
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# nod away by the amount specified by node ...
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# nod away by the amount specified by node ...
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# nod away by the amount specified by node ...
# Created: 23oct98, James E. Larkin
# Modified: 18nov98, JEL for temp files.
#---------------------------------------------------------
modify -s nirspec comment2="Object image for snapi."
#start the first exposure at original location
cp /tmp/TEMPFITS2 /tmp/TEMPSKY2
#---------------------------------------------------------
modify -s nirspec go2=1
wfg2
#After exposure, move by node,nodn
cp /tmp/TEMPFITS2 /tmp/OLDTEMP
#set node = 'show - terse - s nirspec node'
set env IDL_ARG1 " /tmp/TEMPFITS2"
set env IDL_ARG2 " /tmp/TEMPSKY2"
set node = 'show - terse - s nirspec nodn'
# Display the result and exit.
modify -s dcs2 raoff=$node decoff=$nodn rel2curr=t
# Copy original file to temp location to prevent overwriting
modify -s nirspec dispname2="/tmp/sdiff.fits"
modify -s nirspec display2=1
cp /tmp/TEMPFITS2 /tmp/OLDTEMP
#---------------------------------------------------------
modify -s nirspec comment2="Sky image for snapi."
#start the first exposure at original location
modify -s nirspec go2=1
wfg2
#After exposure, move by node,nodn
#set node = 'show - terse - s nirspec node'
/setkoot/kss/nirspec/ui/idllib/sdiff
# Display the result and exit.
modify -s dcs2 raoff=$node decoff=$nodn rel2curr=t
# Copy original file to temp location to prevent overwriting
modify -s nirspec dispname2="/tmp/sdiff.fits"
modify -s nirspec display2=1
cp /kroot/kss/nirspec/ui/csh/sky.au /dev/audio
modify -s nirspec comment2="Sequence is complete."
Software Team

- George Brims - Wrote most of the existing Occam transputer code. Will write new clocking code.

- James Larkin - Written much of the high level code for NIRSPEC including quicklook. Will modify keyword library and quicklook for new clocking and array sizes.