SNAP
SuperNova/Acceleration Probe
NIR Test Software

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What is SNAP?

- Expansion of the universe is accelerating – we don’t know what kind of energy is causing this acceleration
- Space-based telescope to study the expansion of the universe through distance-redshift relation of supernovae
- Expected to find and analyze over 2000 supernovae per year
NIR Sensors

- Wavelength coverage: 0.35 - 1.7 µm.
- Sensors
  - 2k x 2k HgCdTe NIR sensors covering 0.9-1.7 µm.
  - 3.5k x 3.5k CCDs covering 0.35-1.0 µm.
- Michigan group is responsible for testing NIR sensors.
NIR Sensors

- The HgCdTe NIR sensor are attached to a mux (multiplexer)
- 2048 x 2048 pixel mux
- Mux sends the readout to the PC
NIR Test Software

- Assembler code to control the mux
  - Set exposure type
  - Readout modes

- "Voodoo" software provides graphical user interface (Java)
  - Start/stop exposures
  - Create FITS files for images

- IDL etc. for final analysis
NIR Test Software

- Weaknesses of Voodoo
  - Not well documented
  - Hard to modify
  - Makes complex tests difficult

- Necessary to develop our own package of controller software using LabVIEW
  - Widely used commercial tool for DAQ software
  - Integrate new devices into a common framework:
    - Shutters
    - x-y-z stages for intrapixel controller (spot-o-matic)
    - Light sources
    - Temperature sensors
    - Pressure sensors
NIR Test Software Development

PC
PCI Device

Timing Board (DSP)

Clock/Bias (Digital to Analog)

Video (Analog to Digital)

mux
output
input
NIR Test Software Development

- No support for low level device driver system calls in LabVIEW
- C library files must be developed for communication with the PCI device through LabVIEW
Current Progress

- C library development to establish a connection with the PCI
- Establish a connection with the PCI device through LabVIEW
- Load assembler code onto the timing board
- Create FITS files for images from the mux
Current Progress
Future Plans

• Develop various exposure sequence types

• Develop better software structure for maintenance