Full Readout set-up

Connection card + Kapton, NO Detector

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADC gain</td>
<td>9.5</td>
</tr>
<tr>
<td>Noise single channel with 5Mhz ADC clock</td>
<td>17e</td>
</tr>
<tr>
<td>Noise 100khz ADC clock (32 samples)</td>
<td>10 e</td>
</tr>
<tr>
<td>Subtract 2 channels</td>
<td>4.4e</td>
</tr>
</tbody>
</table>

January 3rd 2007
Reference pixel

- Reference pixel noise correlates well with active pixel
- Will always be subtracted in following noise evaluation

Waveform Graph

January 3rd 2007
A.C., C.G., G. S.
Noise: BareMUX, Window mode

- Measurement at T = 110
- Subtract reference pixel of H1RG

Window location (400,410) (400, 410)
Readout frequency 100kHz
255bursts x255frames/bursts 65025 frames
Time span: 1500s

Mean = 7.412421 ADCU (15 e)
Stddev = 0.766897 (error/noise)

Estimated noise: 15 e
(uncorrelated readout noise enters twice)
LED_ON: Detector inhomogeneities (window)
- 10% gain variations
- Scratches (+ some extra dust)
**LED_ON: calibration/Noise**

- Led Off 0.8 pA/photodiode
- Led On D1, 8 µA, $\lambda = 1.65$ µm
- LED_Off: noise = 15 ADCU (30 e) dominant contribution = detector
- LED_ON noise = 41.4 ADCU
  
  $(\text{Noise})^2 = 225 + (e/\text{ADCU}) \times \text{ADC/frame}$
- 2.15 e/ADCU (from 1.66 to 2.40 prelim)

- LED_On D4, 15µA, $\lambda = 1.30$µm
- LED_ON noise = 37.2 ADCU
- 1.66 e/ADCU
LED_ON: calibration/current

- LED_Off D4  0.80pA
- LED_ON D4  4.70PA

- Photodiode diameter 3mm
  26 e/pixel/s *effic expected from ratio of areas
  12750 ADCU/pixel/s  observed
  Again 2 e/ADCU if ratio of efficiencies at $\lambda = 1.65$ μm
  close to 1 between photodiode and H1RG
Noise/Temperature

T = 126 degree
Noise = 22.8 e

T = 157 degree
Noise = 37.6 e
Many tests pending

- Improve calibration
- Efficiency of H1RG from comparison with photodiodes
- Analysis of long exposure
- Use of side reference pixels
- Change clock frequency
- Etc...
- ‘light’ readout system works well, easily adapted to sidecar