4.7.2 Performance verification of NGC prototype with Hawaii-2RG array

The two slot prototype NGC prototype system shown in Figure 44 was used to verify the performance of NGC with a single Hawaii-2RG detector. The NGC first light image shown in Figure 45 was taken in H-band using an integration time of 825 ms. In Figure 46 the readout noise of NGC represented by red diamonds is compared with the readout noise of IRACE represented by black triangles and plotted versus the number of nondestructive readouts. At 64 Fowler pairs the readout noise achieved with NGC is 2.36 erms. For comparison, the value obtained with IRACE is 3.34 erms. These performance figures were obtained with the X-Shooter science grade array, which exhibits exceptionally low readout noise. The saturation level of the detector is at 1.05 E5 e as can be seen in Figure 47 which shows the signal versus the integration time over the full signal range of the Hawaii-2RG array. The tests were performed using IDL scripts communicating with DCS, which was operating reliably from the very start.

Figure 44 NGC prototype for a single Hawaii-2RG array in 32-channel mode containing NGC basic board with fiber communication, sequencer, bias and clock level drivers and AQ-32 board with 32 16-bit ADC's. Top: front side. Bottom: back side.
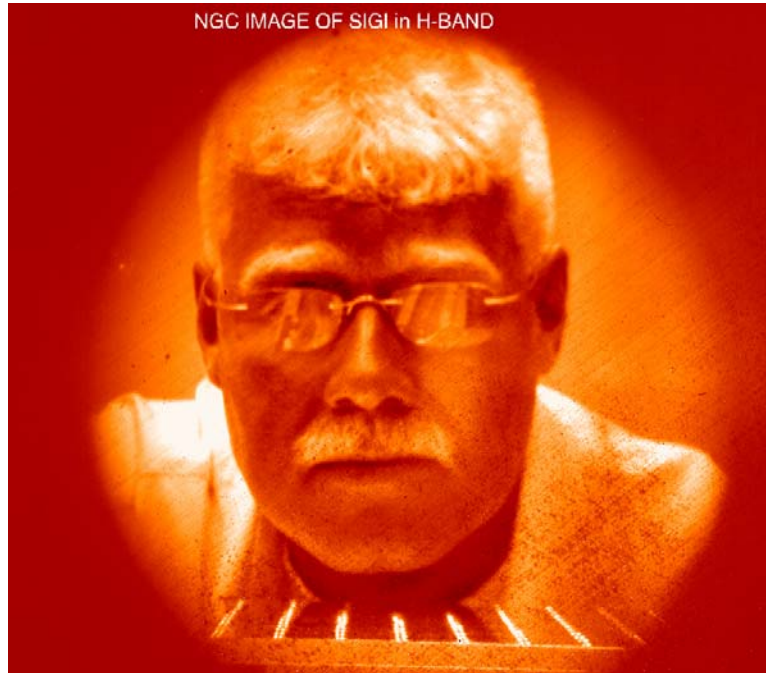
Figure 45 First light image of NGC taken in H-band with Hawaii-2RG array. Integration time 825 ms.
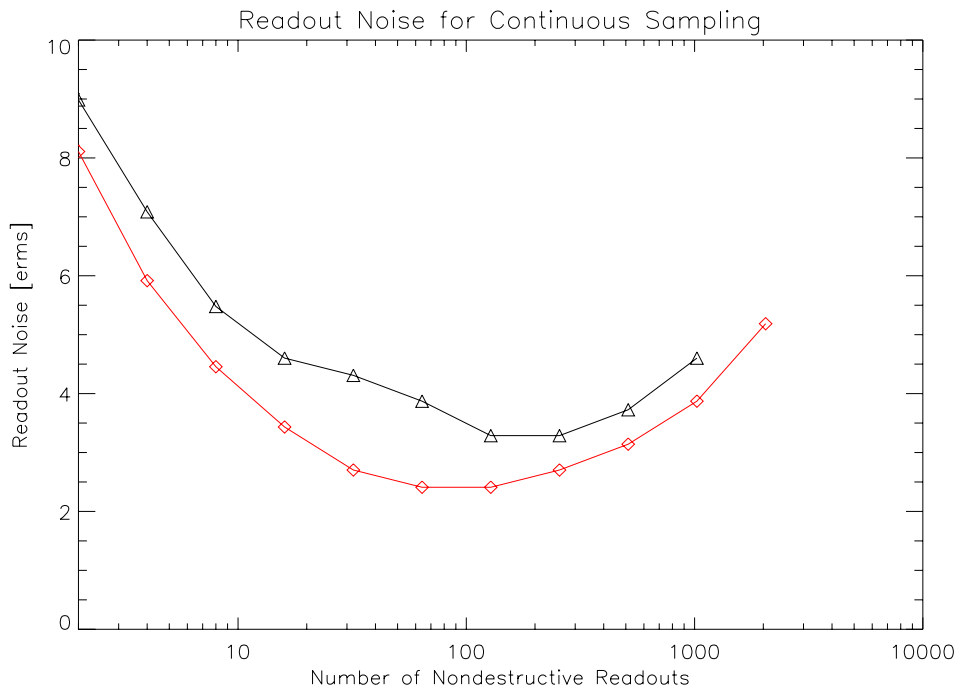

Figure 46 Readout noise versus number of nondestructive readouts. Black triangles: IRACE. Red diamonds: NGC.
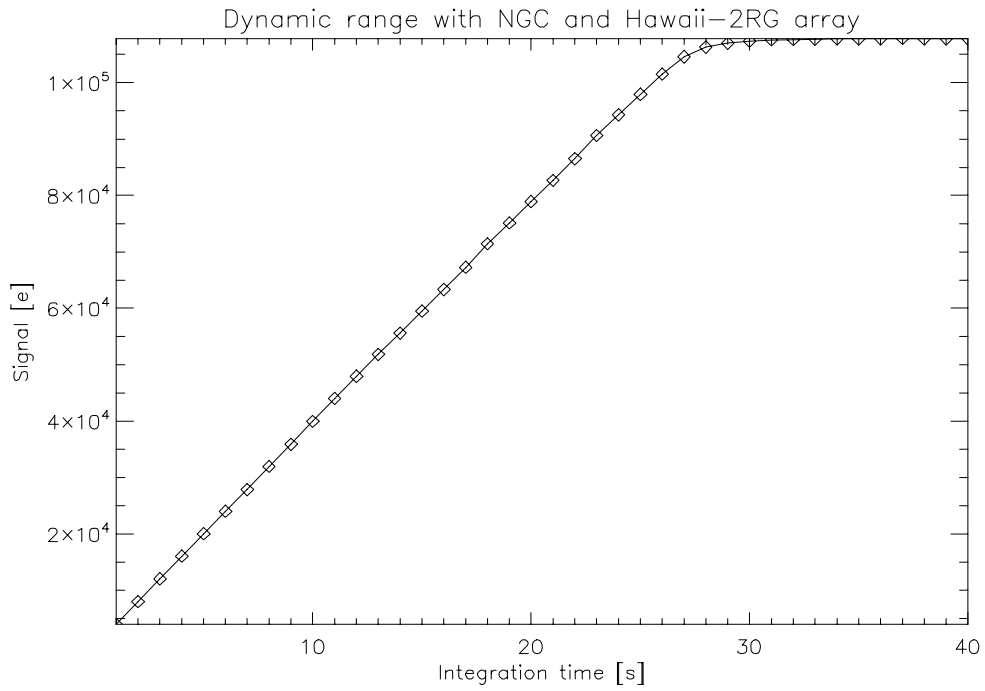
Figure 47 Signal versus integration time of Hawaii-2RG array operated by NGC controller.

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