Flux levels of the PICNIC Camera at IOTA

Sam Ragland dated on 18th Dec. 2003

The flux levels of the PICNIC camera at IOTA are characterized in the H band from data taken on 07 Dec. 2003. Four calibrators of spectral type between early B type and late K type are used. The readout mode adopted for these observations is 1 *Loop* and 4 *Reads*.

Fig. 1 shows observed PICNIC outputs as a function of H magnitude for 1 *Loop* and 4 *Reads*. While taking one telescope data, shutters corresponding to the other two telescope beams are closed. Also, background light levels are taken into account. The values reported here are the average values of the four pixels illuminated by each telescope.

Assuming that the PICNIC has a linear response over its dynamical range, the expected fluxes for different *Loops* and *Reads*, and for a range of H magnitudes are estimated and listed in Table 1. The integration times for various readout modes are taken from Pedretti et al., 2003.

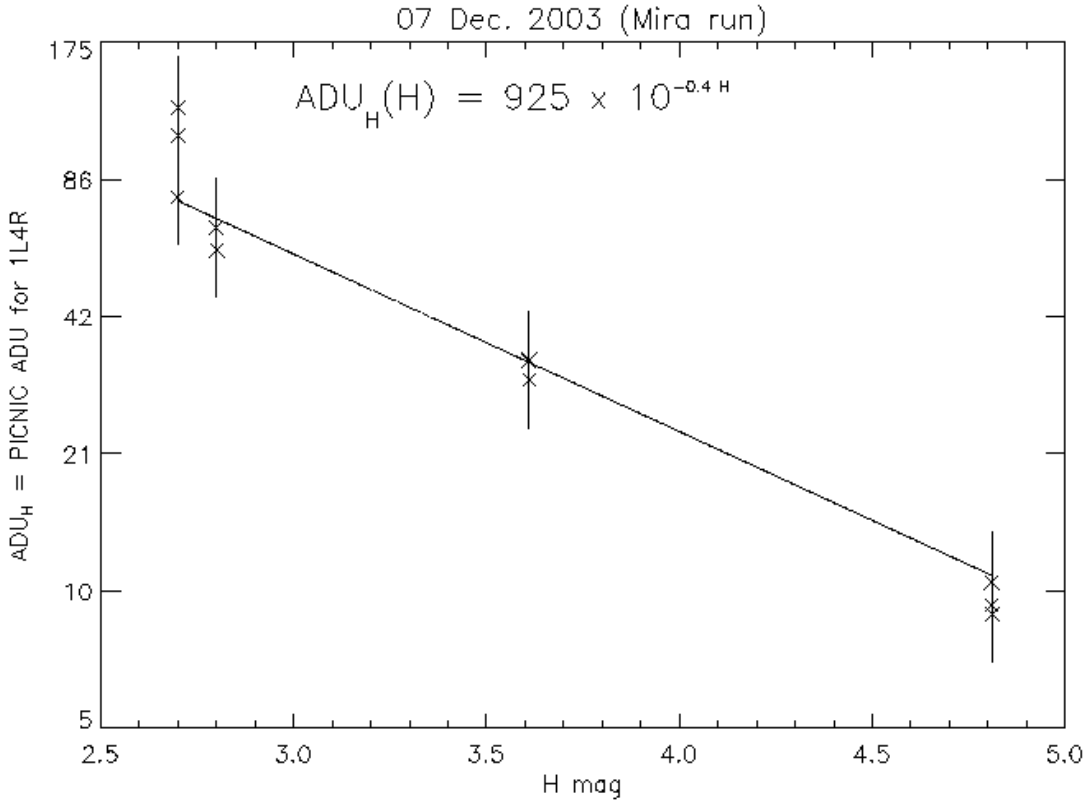

Fig.1: The picnic output (ADU) in H band, for the readout mode of 1 Loop and 4 Reads, is plotted against H magnitude for all three telescopes. A straight line fit with a slope of -0.4 is also shown here.

H mag	1L1R	1L2R	1L3R	1L4R	1L5R	1L6R	1L7R	H mag	2L1R	2L2R	2L3R	2L4R	2L5R	2L6R	2L7R
1.0	149							1.0							
1.5	94	141	185					1.5	182						
2.0	59	89	117	145	174			2.0	115	172					
2.5	37	56	74	91	110	127	143	2.5	73	109	145	180			
3.0	24	35	46	58	69	80	90	3.0	46	69	92	114	137	159	182
3.5	15	22	29	36	44	51	57	3.5	29	43	58	72	86	101	115
4.0	9	14	18	23	28	32	36	4.0	18	27	36	45	54	63	73
4.5	6	9	12	14	17	20	23	4.5	11	17	23	29	34	40	46
5.0	4	6	7	9	11	13	14	5.0	7	11	15	18	22	25	29
5.5	2	4	5	6	7	8	9	5.5	5	7	9	11	14	16	18
6.0		2	3	4	4	5	6	6.0	3	4	6	7	9	10	12
6.5			2	2	3	3	4	6.5	2	3	4	5	5	6	7
7.0					2	2	2	7.0		2	2	3	3	4	5

H mag	3L1R	3L2R	3L3R	3L4R	3L5R	3L6R	3L7R	H mag	4L1R	4L2R	4L3R	4L4R	4L5R	4L6R	4L7R
2.0	171							2.0							
2.5	108	162						2.5	143						
3.0	68	102	136	170				3.0	90	135	181				
3.5	43	64	86	107	129	150	172	3.5	57	85	114	143	171		
4.0	27	41	54	68	81	95	108	4.0	36	54	72	90	108	126	144
4.5	17	26	34	43	51	60	68	4.5	23	34	45	57	68	80	91
5.0	11	16	22	27	32	38	43	5.0	14	21	29	36	43	50	57
5.5	7	10	14	17	20	24	27	5.5	9	14	18	23	27	32	36
6.0	4	6	9	11	13	15	17	6.0	6	9	11	14	17	20	23
6.5	3	4	5	7	8	9	11	6.5	4	5	7	9	11	13	14
7.0	2	3	3	4	5	6	7	7.0	2	3	5	6	7	8	9
7.5		2	2	3	3	4	4	7.5		2	3	4	4	5	6
8.0				2	2	2	3	8.0			2	2	3	3	4

H mag	5L1R	5L2R	5L3R	5L4R	5L5R	5L6R	5L7R	H mag	6L1R	6L2R	6L3R	6L4R	6L5R	6L6R	6L7R
2.5	178							2.5							
3.0	112	169						3.0	134						
3.5	71	107	143	178				3.5	84	128	171				
4.0	45	67	90	113	135	158	181	4.0	53	81	108	135	162	189	
4.5	28	42	57	71	85	100	114	4.5	34	51	68	85	102	119	137
5.0	18	27	36	45	54	63	72	5.0	21	32	43	54	65	75	86
5.5	11	17	23	28	34	40	45	5.5	13	20	27	34	41	47	54
6.0	7	11	14	18	21	25	29	6.0	8	13	17	21	26	30	34
6.5	4	7	9	11	14	16	18	6.5	5	8	11	13	16	19	22
7.0	3	4	6	7	9	10	11	7.0	3	5	7	9	10	12	14
7.5	2	3	4	4	5	6	7	7.5	2	3	4	5	6	8	9
8.0		2	2	3	3	4	5	8.0		2	3	3	4	5	5

H mag	7L1R	7L2R	7L3R	7L4R	7L5R	7L6R	7L7R	H mag	7L1R	7L2R	7L3R	7L4R	7L5R	7L6R	7L7R
3.0	156							6.0	10	15	20	25	30	35	40
3.5	98	149	199					6.5	6	9	13	16	19	22	25
4.0	62	94	126	157	189			7.0	4	6	8	10	12	14	16
4.5	39	59	79	99	119	139	159	7.5	2	4	5	6	8	9	10
5.0	25	37	50	63	75	88	100	8.0	2	2	3	4	5	6	6
5.5	16	24	32	40	47	55	63	8.5			2	2	3	3	4

Table 1: The expected picnic output in H band for each telescope as a function of H magnitude and readout modes.

Since K magnitudes are more easily available in the literature than H magnitude, the expected picnic outputs are also given as a function of K magnitudes (Fig.2 & Table 2). Although color corrections are not applied here, the straight line fit suggests that this **calibration is probably not very sensitive to the spectral type of the target** (note that stars of different spectral type ranging from early B type to late K type are used for this calibration).

The **Zero H-magnitude flux is 925 ADU for** 1 loop and 4 reads and the **Zero K-magnitude flux is 838 ADU for** 1 loop and 4 reads**.** Note that the zero magnitude flux are only for calculation purposes and the picnic would saturate around H=1.5 for 1 loop and 4 reads.

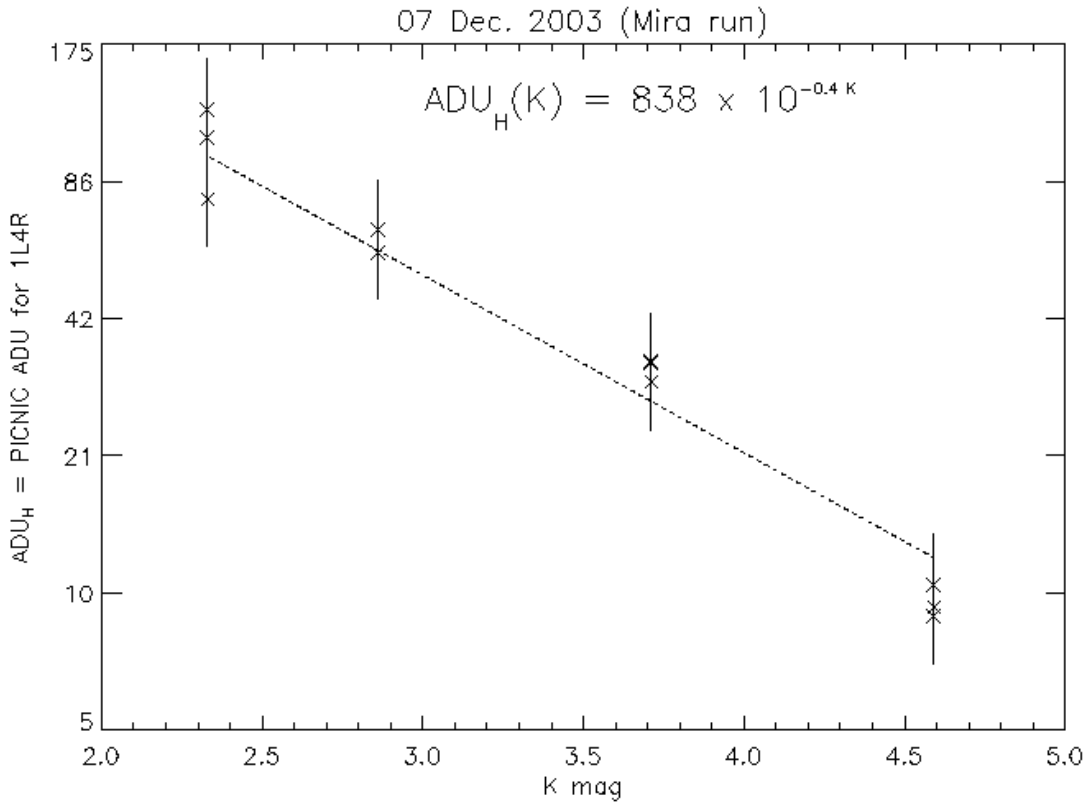

Fig.2: The picnic output (ADU) in H band, for the readout mode of 1 loop and 4 reads, is plotted against K magnitude for all three telescopes. A straight line fit with a slope of -0.4 is shown here.

K mag	1L1R	1L2R	1L3R	1L4R	1L5R	1L6R	1L7R	K mag	2L1R	2L2R	2L3R	2L4R	2L5R	2L6R	2L7R
1.0	136							1.0							
1.5	86	128	169					1.5	166						
2.0	54	81	106	132	159			2.0	105	157					
2.5	34	51	67	83	100	116	130	2.5	66	99	132	164			
3.0	21	32	42	52	63	73	82	3.0	42	63	83	104	125	145	166
3.5	14	20	27	33	40	46	52	3.5	26	39	53	65	79	92	105
4.0	9	13	17	21	25	29	33	4.0	17	25	33	41	50	58	66
4.5	5	8	11	13	16	18	21	4.5	10	16	21	26	31	37	42
5.0	3	5	7	8	10	12	13	5.0	7	10	13	16	20	23	26
5.5	2	3	4	5	6	7	8	5.5	4	6	8	10	12	15	17
6.0		2	3	3	4	5	5	6.0	3	4	5	7	8	9	10
6.5			2	2	3	3	3	6.5	2	2	3	4	5	6	7
7.0					2	2	2	7.0		2	2	3	3	4	4
K mag	**3L1R**	**3L2R**	**3L3R**	**3L4R**	**3L5R**	**3L6R**	**3L7R**	**K mag**	**4L1R**	**4L2R**	**4L3R**	**4L4R**	**4L5R**	**4L6R**	**4L7R**
2.0	156							2.0							
2.5	98	147						2.5	130						
3.0	62	93	124	155				3.0	82	123	165				
3.5	39	59	78	98	118	137	157	3.5	52	78	104	130	156		
4.0	25	37	49	62	74	87	99	4.0	33	49	66	82	99	115	132
4.5	16	23	31	39	47	55	62	4.5	21	31	41	52	62	73	83
5.0	10	15	20	25	30	34	39	5.0	13	20	26	33	39	46	52
5.5	6	9	12	15	19	22	25	5.5	8	12	17	21	25	29	33
6.0	4	6	8	10	12	14	16	6.0	5	8	10	13	16	18	21
6.5	2	4	5	6	7	9	10	6.5	3	5	7	8	10	12	13
7.0	2	2	3	4	5	5	6	7.0	2	3	4	5	6	7	8
7.5			2	2	3	3	4	7.5		2	3	3	4	5	5
8.0				2	2	2	2	8.0			2	2	2	3	3
K mag	**5L1R**	**5L2R**	**5L3R**	**5L4R**	**5L5R**	**5L6R**	**5L7R**	**K mag**	**6L1R**	**6L2R**	**6L3R**	**6L4R**	**6L5R**	**6L6R**	**6L7R**
2.5	162							2.5							
3.0	102	154						3.0	122						
3.5	65	97	130	163				3.5	77	116	156				
4.0	41	61	82	103	123	144	165	4.0	49	74	98	123	148	172	
4.5	26	39	52	65	78	91	104	4.5	31	46	62	78	93	109	125
5.0	16	24	33	41	49	57	66	5.0	19	29	39	49	59	69	79
5.5	10	15	21	26	31	36	41	5.5	12	18	25	31	37	43	50
6.0	6	10	13	16	20	23	26	6.0	8	12	16	20	23	27	31
6.5	4	6	8	10	12	14	16	6.5	5	7	10	12	15	17	20
7.0	3	4	5	6	8	9	10	7.0	3	5	6	8	9	11	12
7.5	2	2	3	4	5	6	7	7.5	2	3	4	5	6	7	8
8.0		2	2	3	3	4	4	8.0		2	2	3	4	4	5
K mag	**7L1R**	**7L2R**	**7L3R**	**7L4R**	**7L5R**	**7L6R**	**7L7R**	**K mag**	**7L1R**	**7L2R**	**7L3R**	**7L4R**	**7L5R**	**7L6R**	**7L7R**
3.0	142							6.0	9	14	18	23	27	32	36
3.5	90	136	182					6.5	6	9	11	14	17	20	23
4.0	57	86	115	143	172			7.0	4	5	7	9	11	13	15
4.5	36	54	72	91	109	127	145	7.5	2	3	5	6	7	8	9
5.0	23	34	46	57	69	80	92	8.0		2	3	4	4	5	6
5.5	14	21	29	36	43	51	58	8.5			2	2	3	3	4

Table 2: The expected picnic signals in H band, as a function of K magnitude for various readout modes).