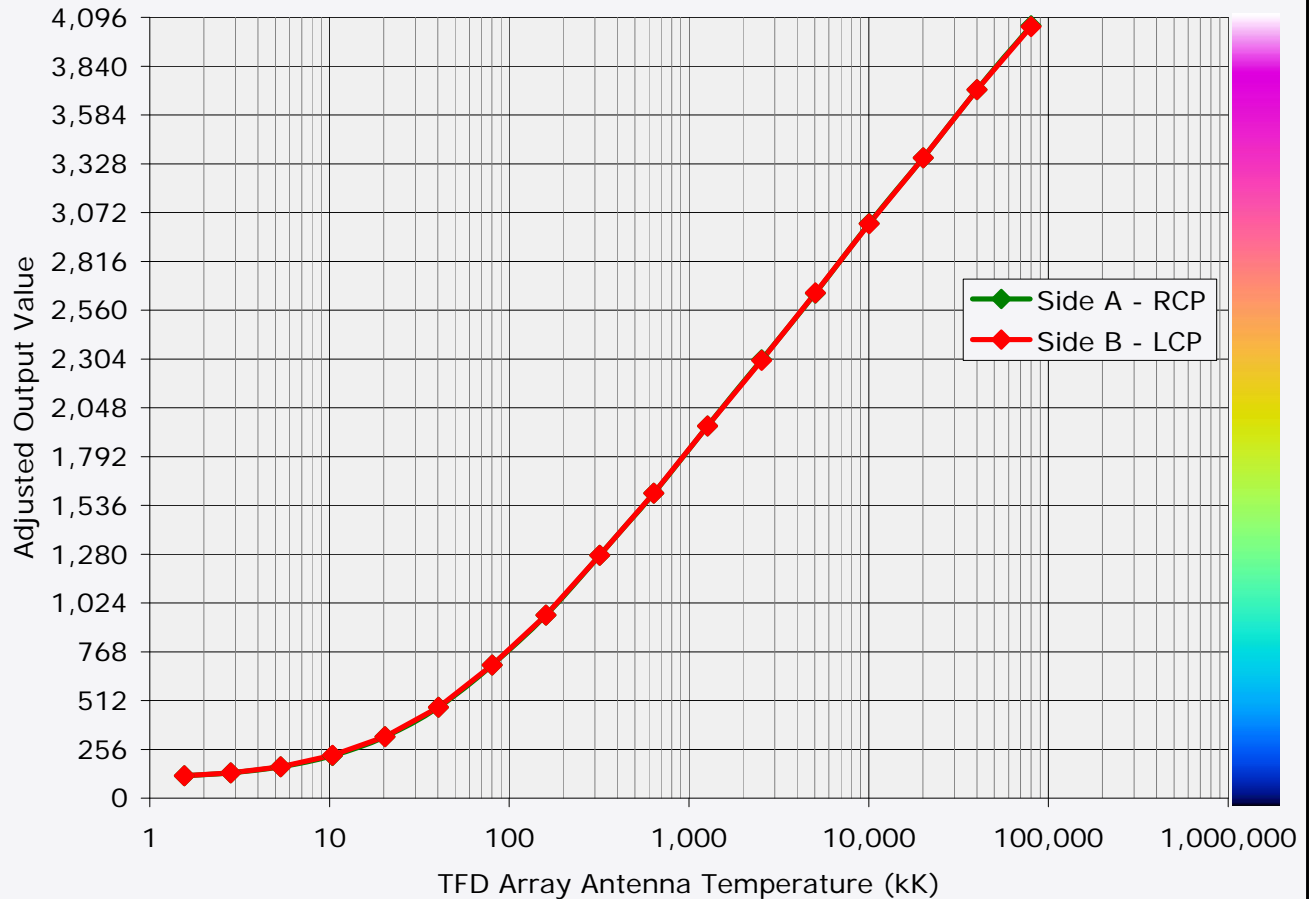


HNRAO FSX-7S (12-bit) Spectrograph Step Calibration – 05-Mar-2016

Adjusted Output Value & Color vs Antenna Temperature for 2.8 dB Feed Loss

Color Bar Corresponds to RSS Color Offset = 750, Color Gain = 2.25

$$\text{Adjusted Output Value} = (\text{Raw ADC Output Value} - \text{Color Offset}) * \text{Color Gain}$$



HNRAO FSX-7S (12-bit) Spectrograph Step Calibration

05-Mar-2016 19:41 UTC

HP461A noise source + attenuators + MCL Splitter

Calibration Plane: Spectrograph Inputs

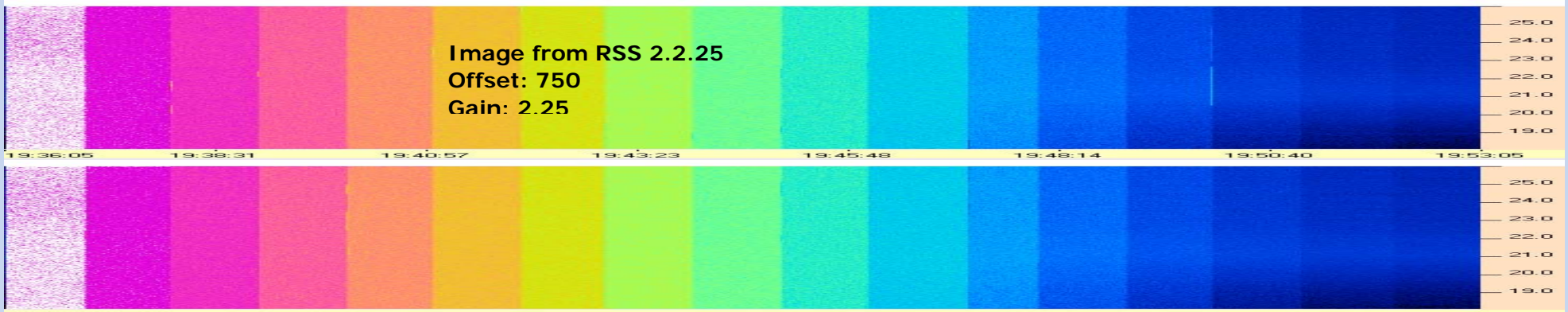
T0 (K)	290
Noise source temperature (MK)	42.0
Feed loss, cal plane to antenna (dB)	2.8
Receiver noise figure (dB)	6.0

	Side A	Side B	Side A	Side B
RSS Color Offset:	750	750	750	750
RSS Color Gain:	2.00	2.00	2.25	2.25

Solar

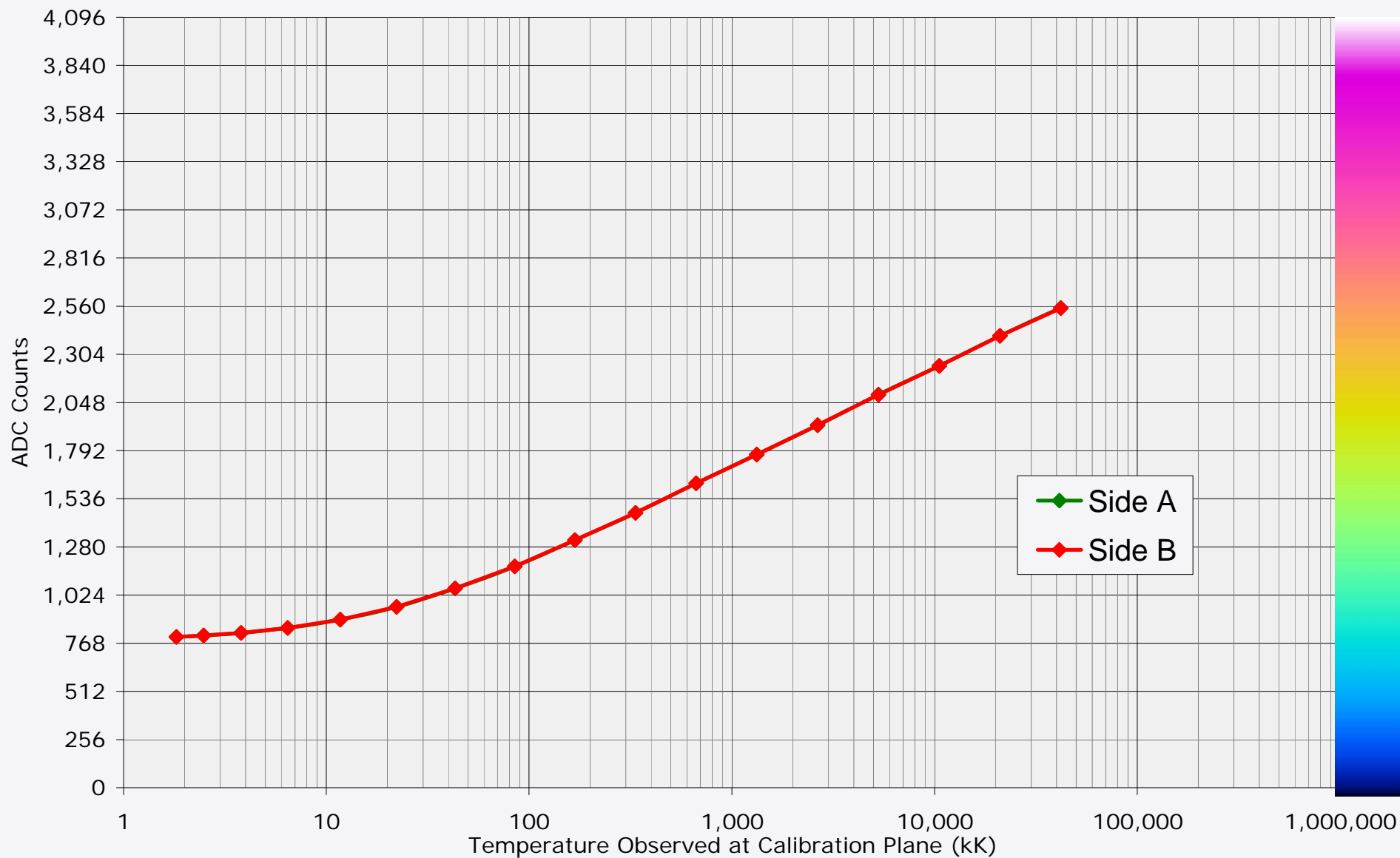
Jupiter

Att. dB	Source Temp (kK)	Equiv. Ant. Temp. (kK)	Side A ADC Counts	Side B ADC Counts	Adjusted Value	Adjusted Value	Adjusted Value	Adjusted Value
0.0	42,001	80,029	2551	2549	3602	3598	4052	4048
3.0	21,051	40,110	2402	2402	3304	3304	3717	3717
6.0	10,551	20,103	2243	2243	2986	2986	3359	3359
9.0	5,289	10,075	2090	2089	2680	2678	3015	3013
12.0	2,651	5,050	1927	1928	2354	2356	2648	2651
15.0	1,329	2,531	1772	1771	2044	2042	2300	2297
18.0	667	1,269	1618	1618	1736	1736	1953	1953
21.0	335	636	1461	1461	1422	1422	1600	1600
24.0	168	319	1316	1316	1132	1132	1274	1274
27.0	85	160	1177	1177	854	854	961	961
30.0	43	80	1060	1060	620	620	698	698
33.0	22	40	962	962	424	424	477	477
36.0	11.7	20	893	893	286	286	322	322
39.0	6.4	10	849	850	198	200	223	225
42.0	3.8	5.3	823	823	146	146	164	164
45.0	2.5	2.8	809	809	118	118	133	133
48.0	1.8	1.6	802	802	104	104	117	117



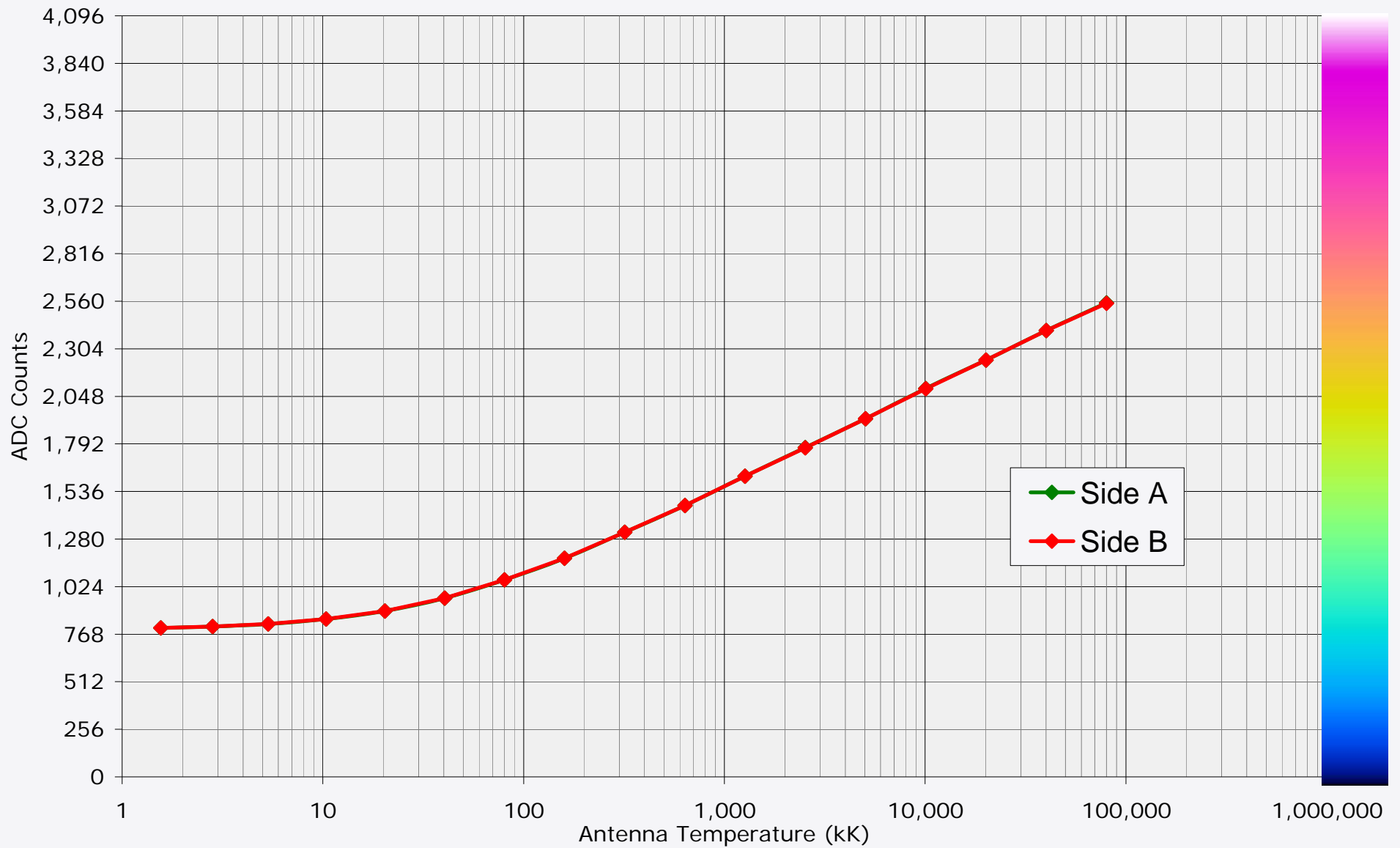
Raw ADC Output Value & Color vs Temperature Observed at Spectrograph Inputs

Color Bar Corresponds to RSS Color Offset = 0, Color Gain = 1



Raw ADC Output Value & Color vs Antenna Temperature for 2.8 dB Feed Loss

Color Bar Corresponds to RSS Color Offset = 0, Color Gain = 1



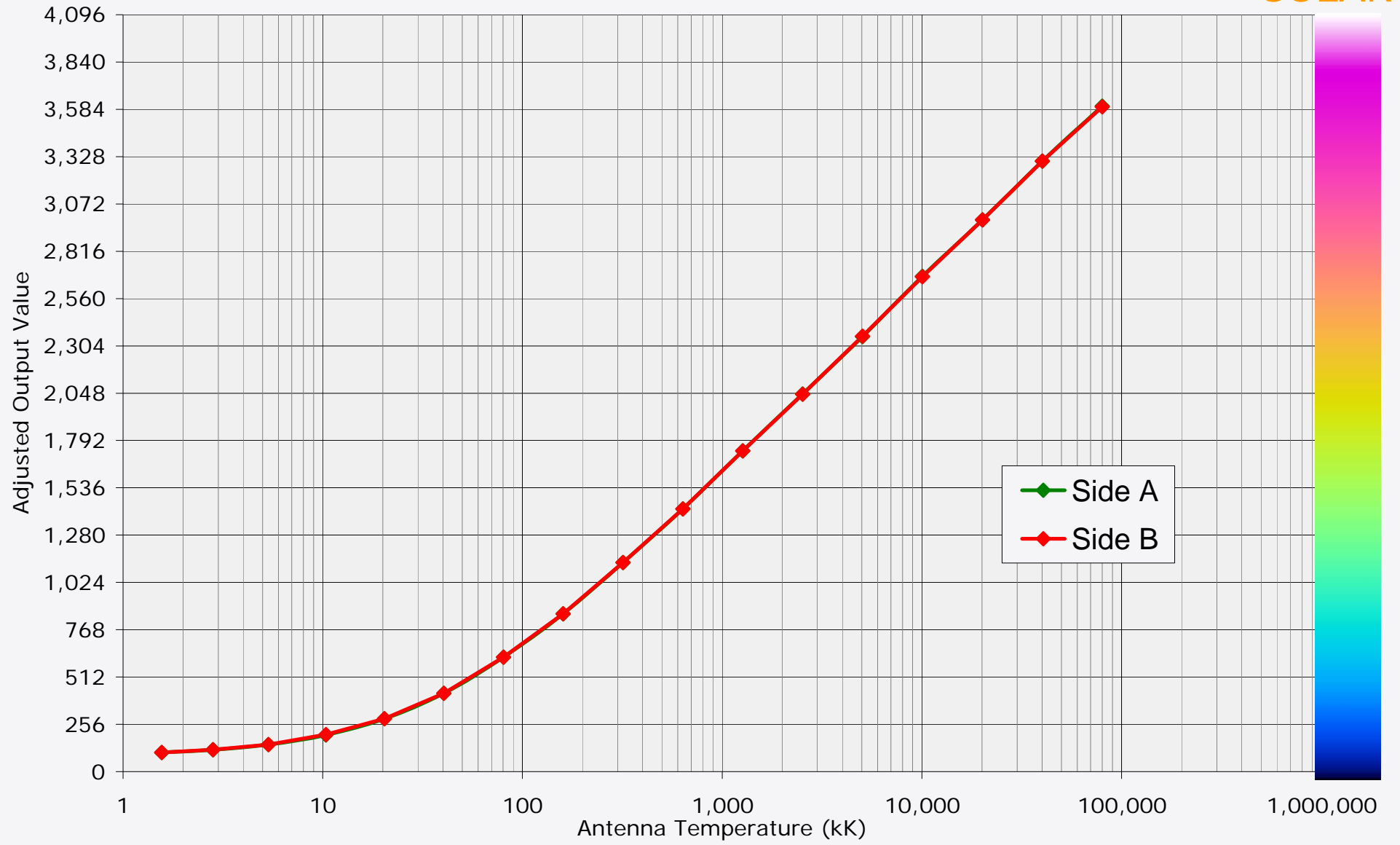
Side A
 Offset: 750
 Gain: 2.00

Side B
 Offset: 750
 Gain: 2.00

Adjusted Output Value & Color vs Antenna Temperature for 2.8 dB Feed Loss

Color Bar Corresponds to RSS Color Offset = 750, Color Gain = 2.00

SOLAR



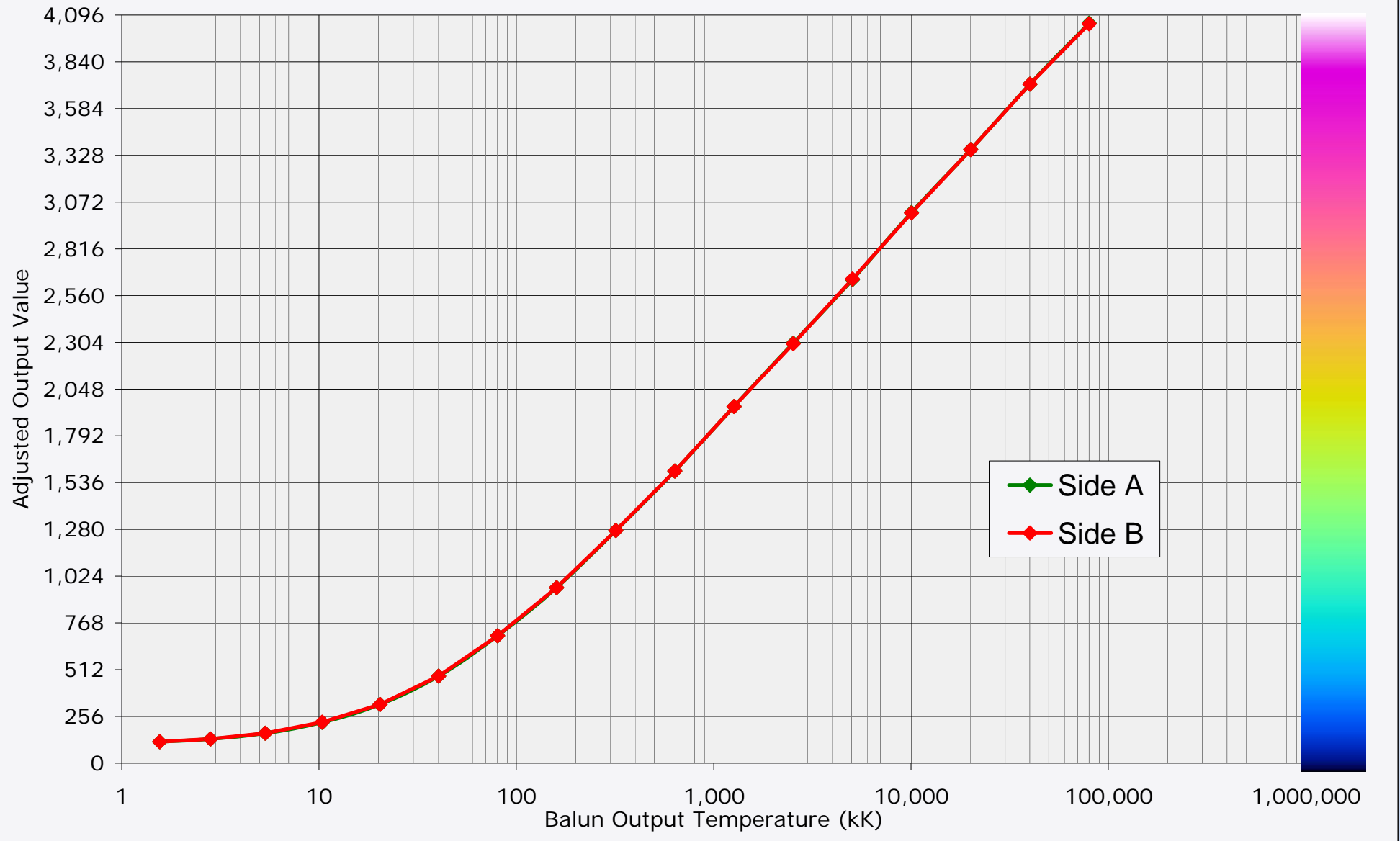
Side A
 Offset: 750
 Gain: 2.25

Side B
 Offset: 750
 Gain: 2.25

Adjusted Output Value & Color vs Antenna Temperature for 2.8 dB Feed Loss

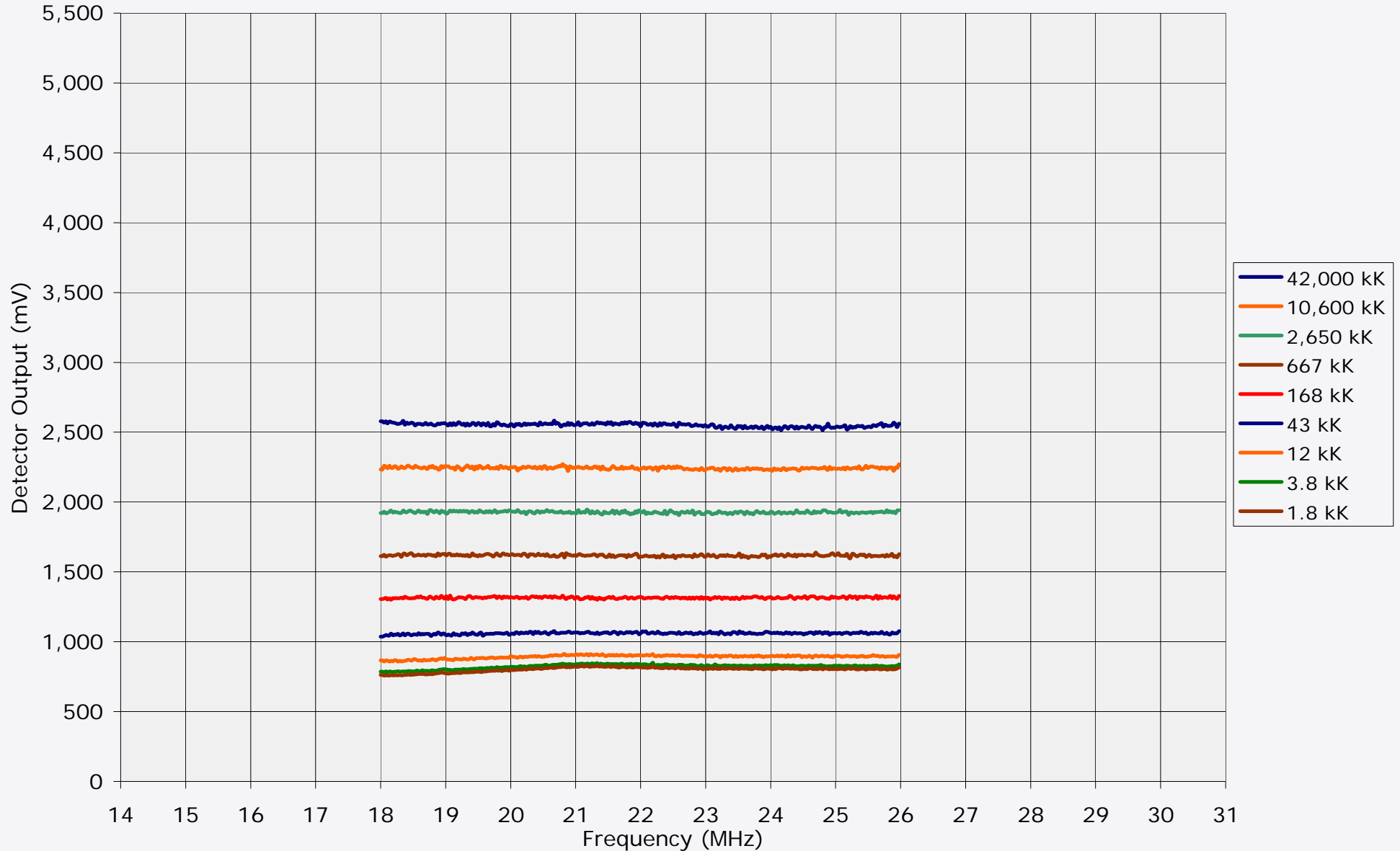
Color Bar Corresponds to RSS Color Offset = 750, Color Gain = 2.25

JUPITER



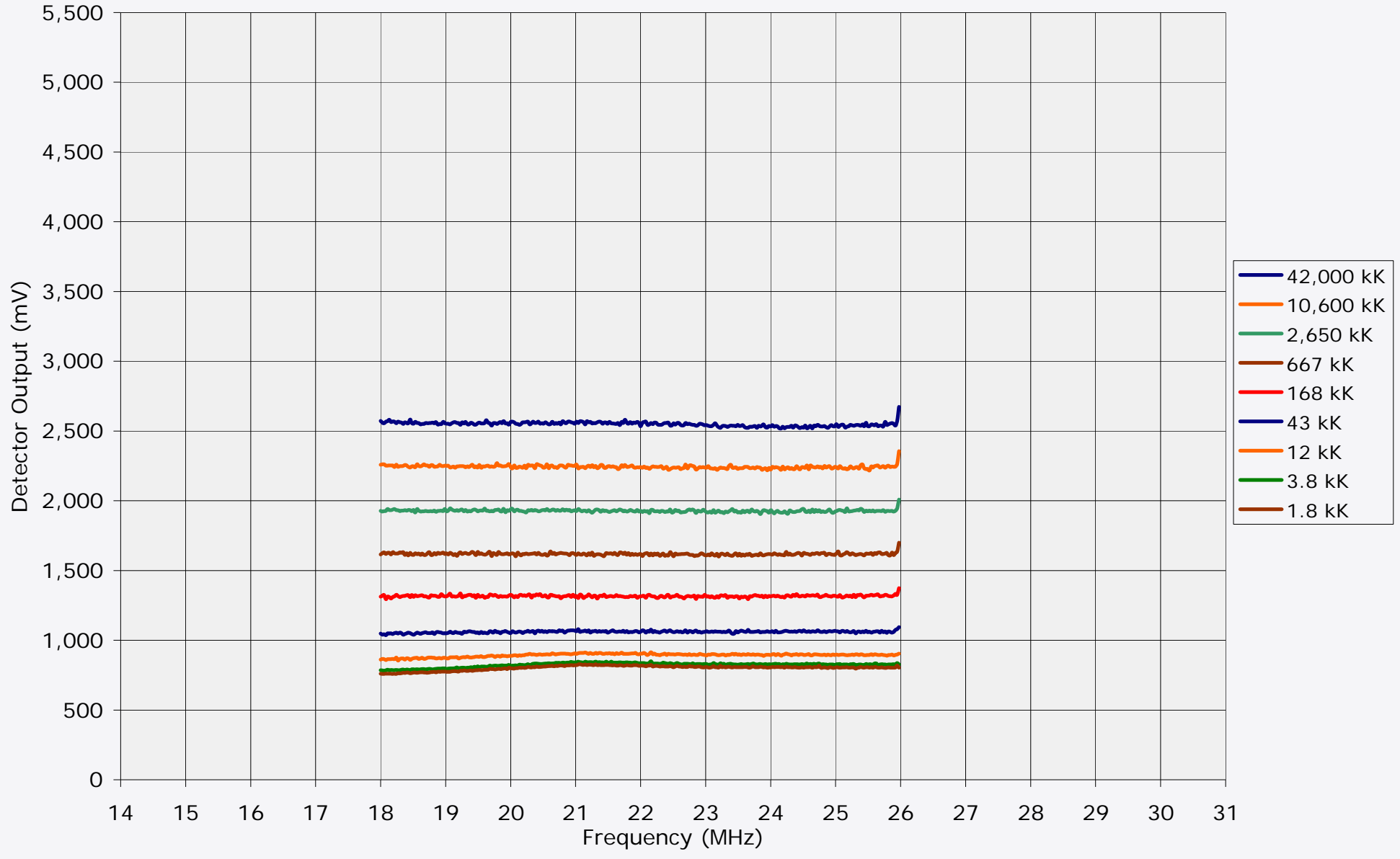
Side A Detector Output vs Frequency vs Temperature Observed at Spectrograph Inputs

ADC Voltage Reference = 4.096 V Receiver Noise Figure = 6 dB



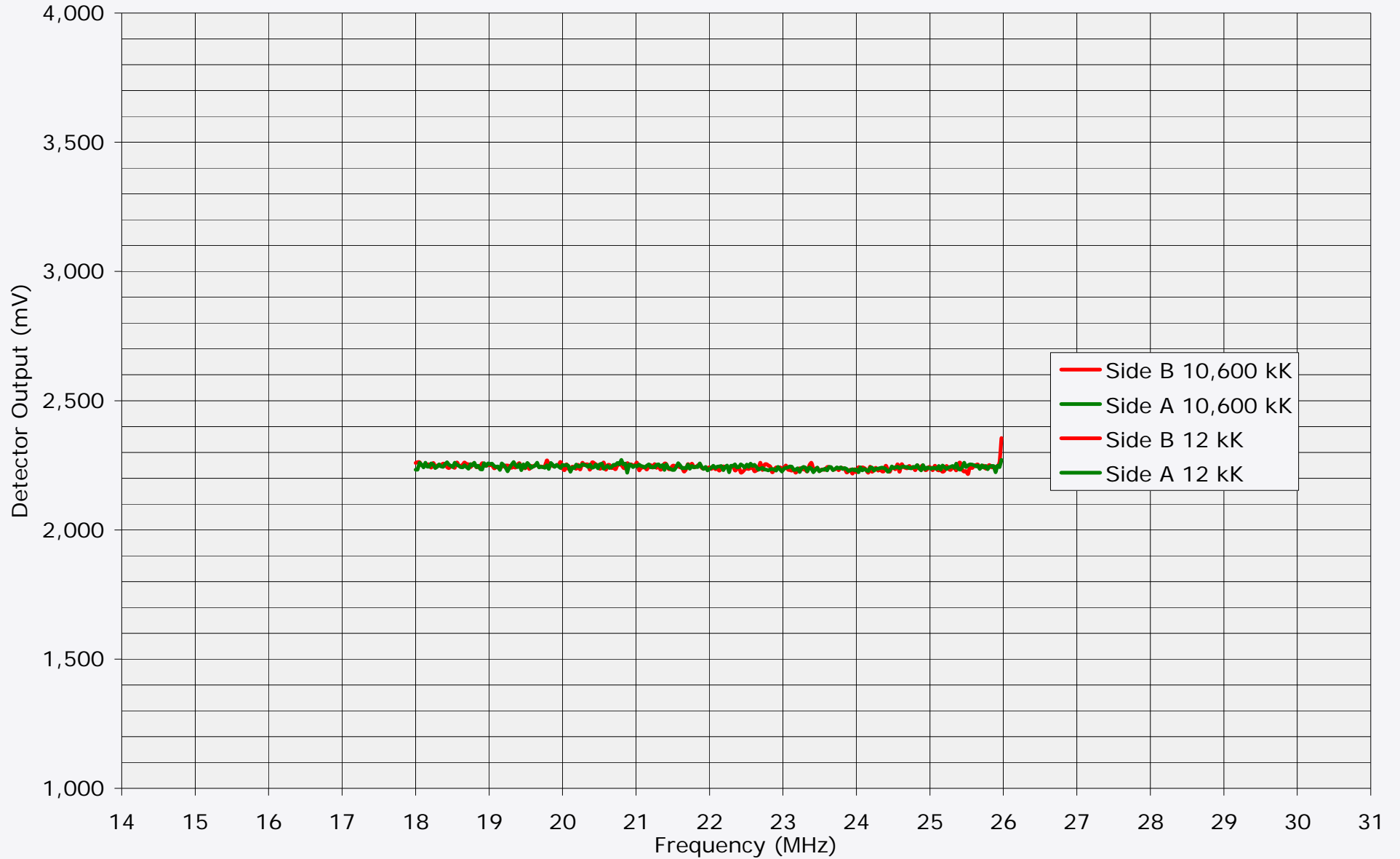
Side B Detector Output vs Frequency vs Temperature Observed at Spectrograph Inputs

ADC Voltage Reference = 4.096 V Receiver Noise Figure = 6 dB

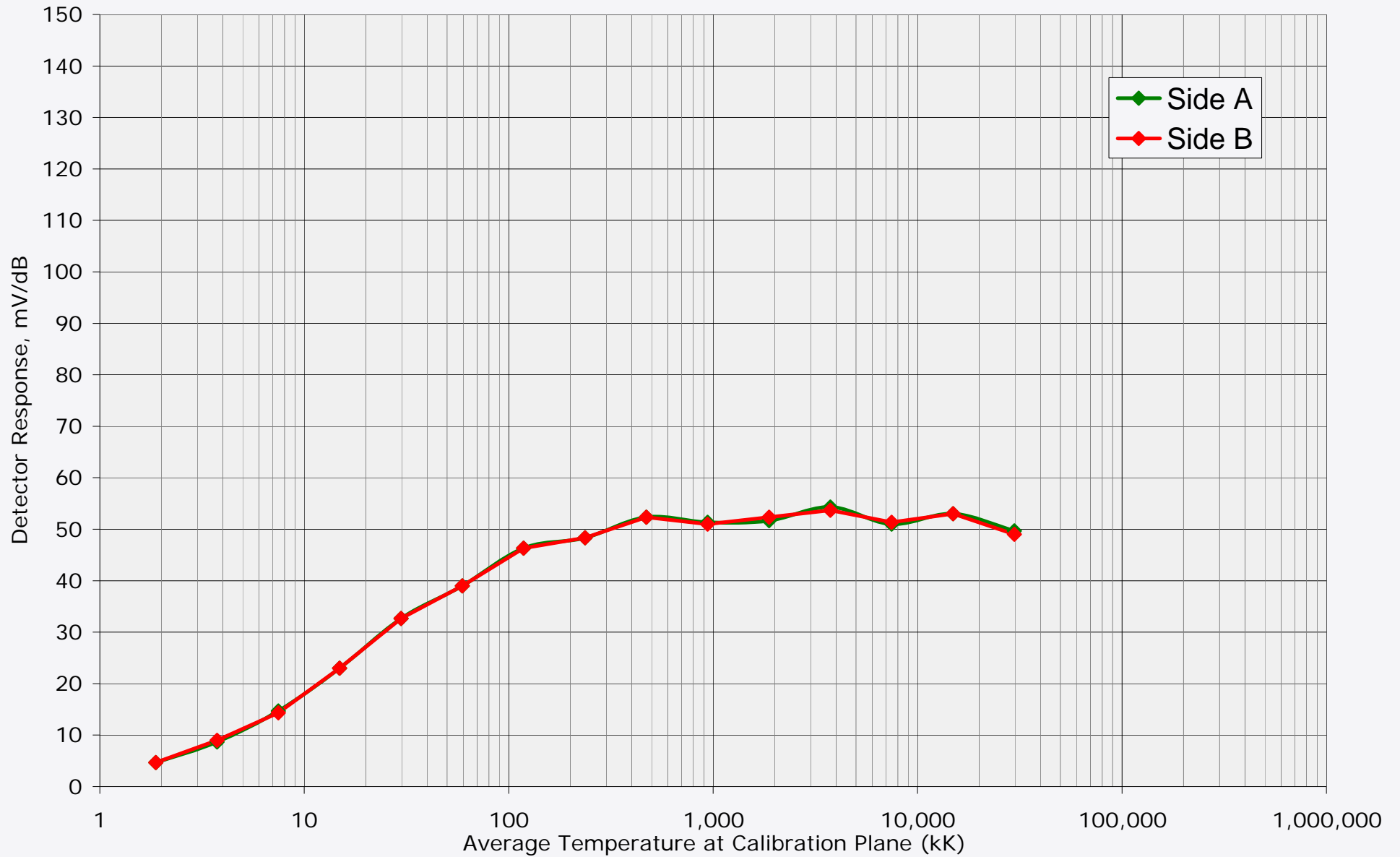


Side A & B Detector Output vs Frequency vs Temperature Observed at Spectrograph Inputs

ADC Voltage Reference = 4.096 V Receiver Noise Figure = 6 dB



Detector Response Averaged Over Adjacent 3 dB Calibration Steps



Side B – Side A Response Mismatch

