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To: EDGES Group

From: Alan E.E. Rogers

Subject: Lowband1 and Lowband2 signature search using lowband2 receiver calibrations at 15 and 35 C.

Figures 1 and 2 show the results of a signature search using lowband1 data from 2016_251 to 2017_094. This data which was taken with the receiver temperature controlled at 25 C has been processed with calibrations made using the lowband2 receiver:

S11_calibration_low_band_LNA15degC_2016-12-14-23-01-53.txt

and

S11_calibation_low_band_LNA35degC_2016-12-14-23-35-37.txt

and antenna S11

S11_blade_low_band_2015_342_03_14.txt

Figure 3 shows the signature search using receiver: calibration:

The lowband1 results which were taken with receiver1 show that even using calibrations from receiver-2 and at temperature 10 C from 25 C show that the signature can still be detected when there is sufficient data to allow a 7 terms polynomial to remove systematics. Tests made using lowband2 data taken with antenna NS was processed with 15 C and 35 C calibrations give the following results:

Freq	SNR	Amp	Width	Temp	Calibration file
78.5	24.5	0.64	22.8	15	a
78.9	16.4	0.48	22.7	35	c
79.3	16.6	0.34	16.1	15	b
78.9	12.8	0.27	16.1	35	d

a = S11_calibration_low_band_LNA15degC_2016-12-14-23-01-53.txt
b = S11_calibration_low_band_LNA15degC_2017-03-02-05-48-33_S11recv2017.txt
c = S11_calibration_low_band_LNA15degC_2016_12-14-23-35-37.txt
d = S11_calibration_low_band_LNA15degC_2017-03-03-20-52-01.txt

A frequency coverage of 61-99 MHz was used.

5 physical terms were removed and S11_low2-mar28-4.txt was used for the antenna S11. These results are shown in Figures 4, 5, 6 and 7.
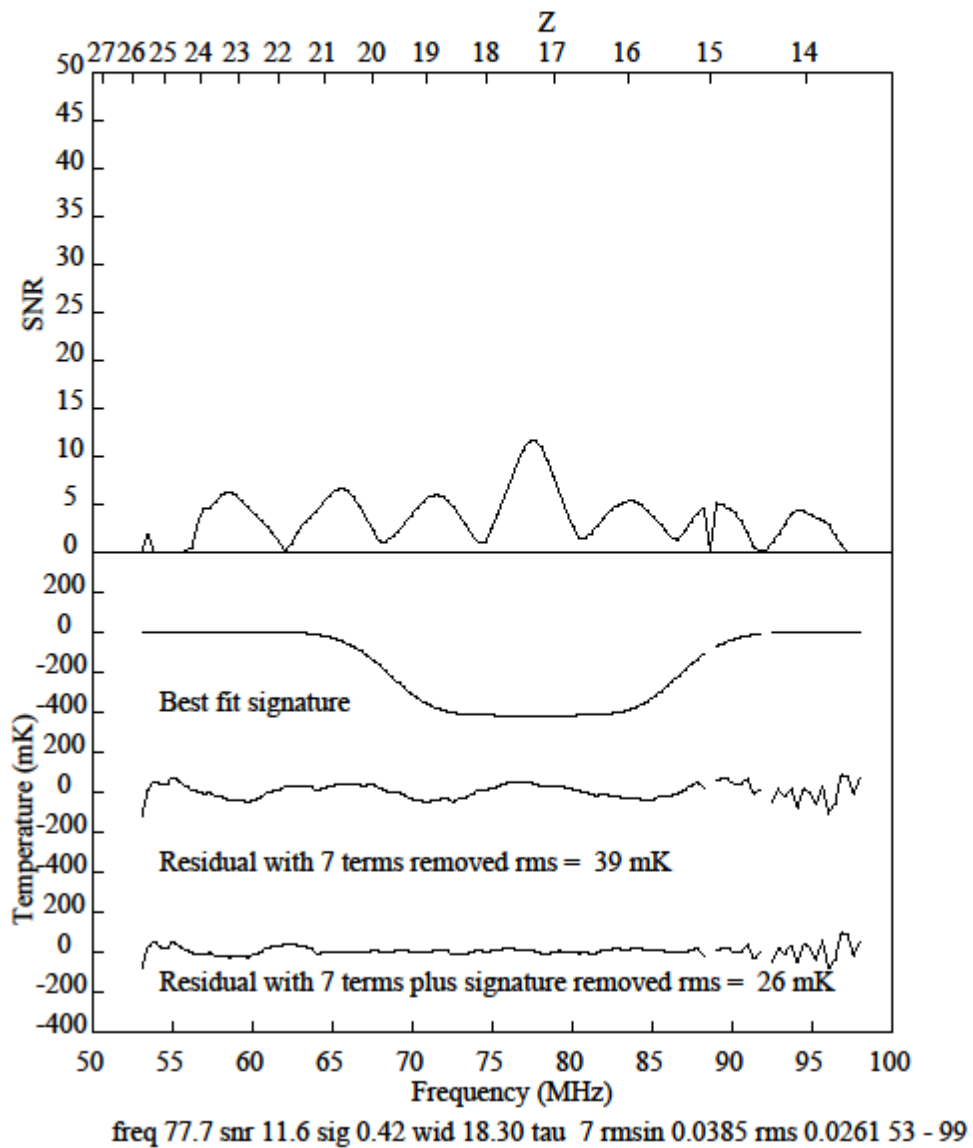
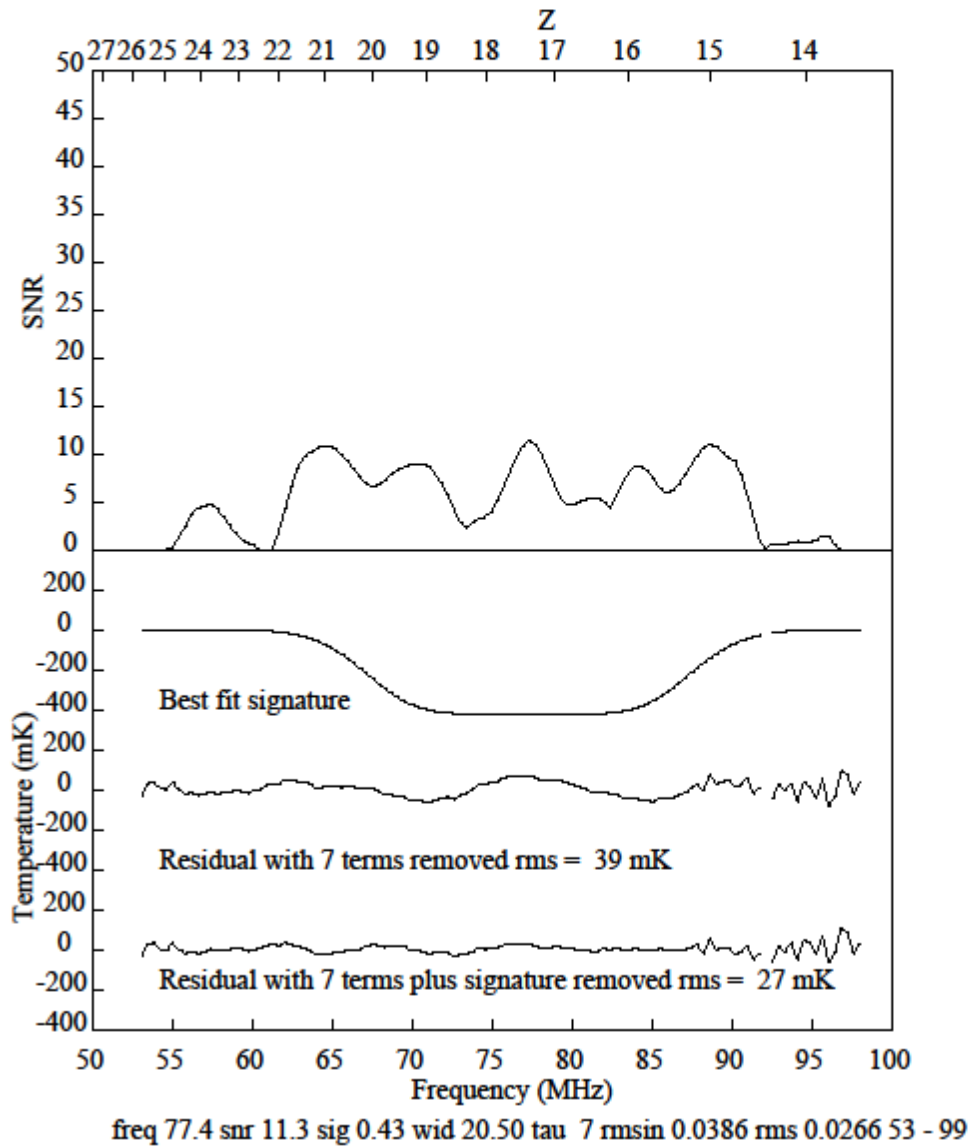Figure 1. Signature search of lowband1 data using receiver2 calibration made at 15 C.

Figure 2. Signature search of lowband1 data using receiver2 calibration made at 35 C.
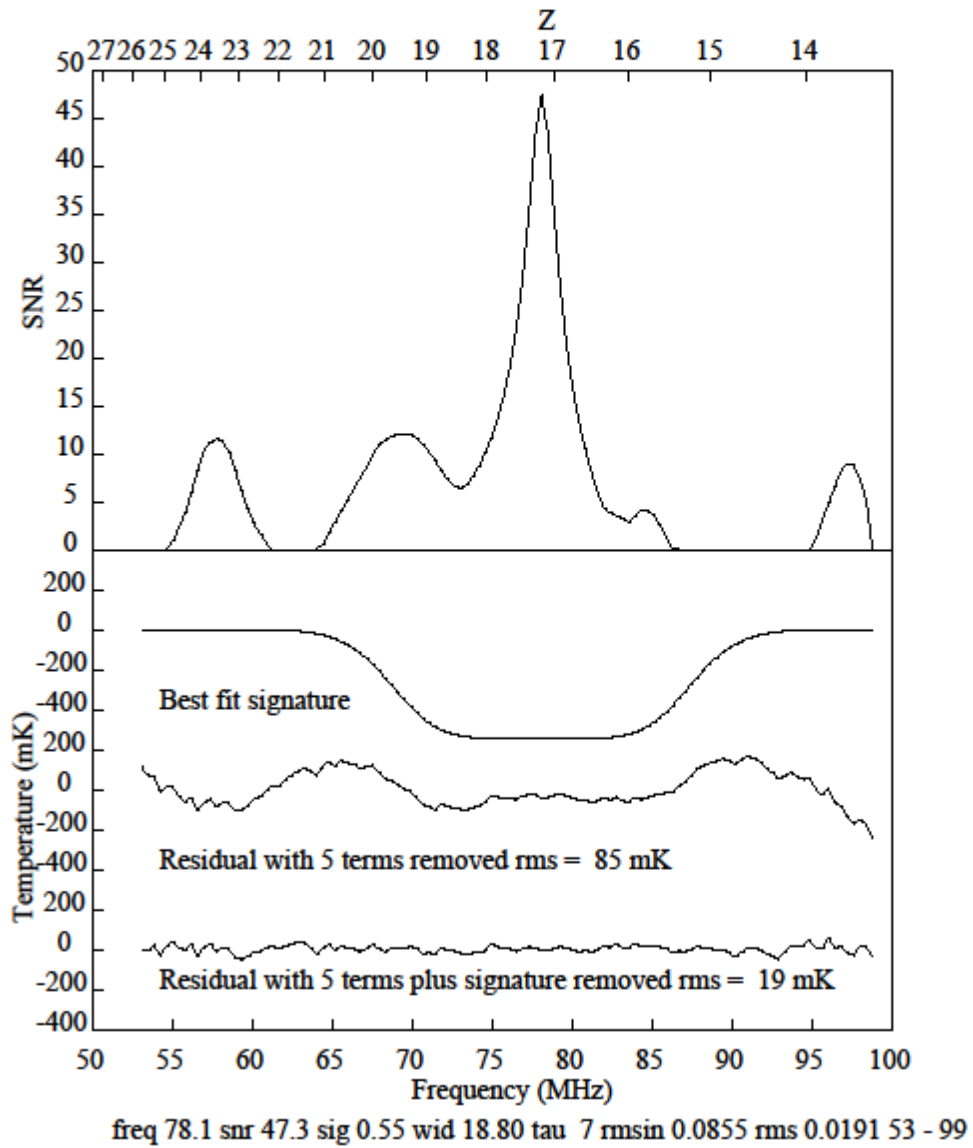
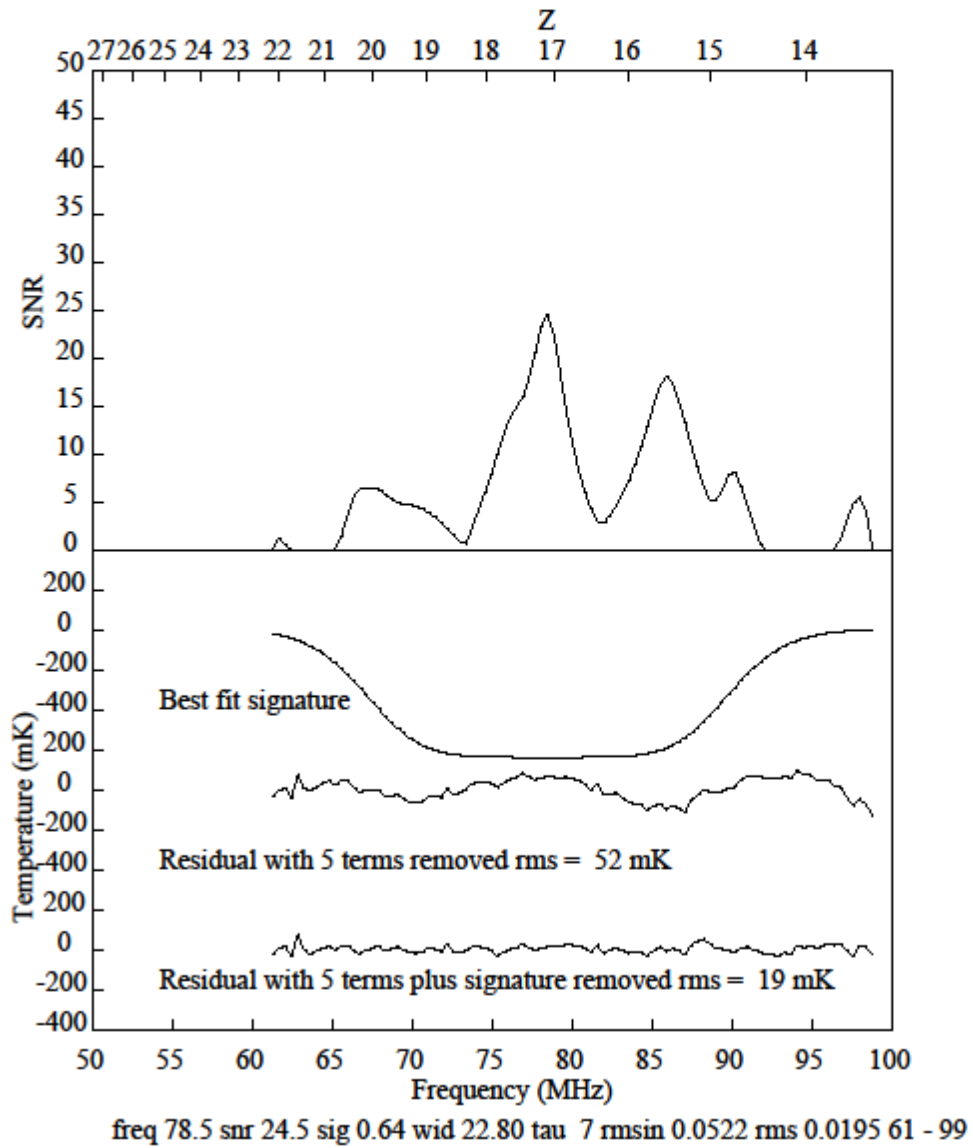Figure 3. Signature search on lowband1 data using receiver calibration of receiver1 made at 25 C.

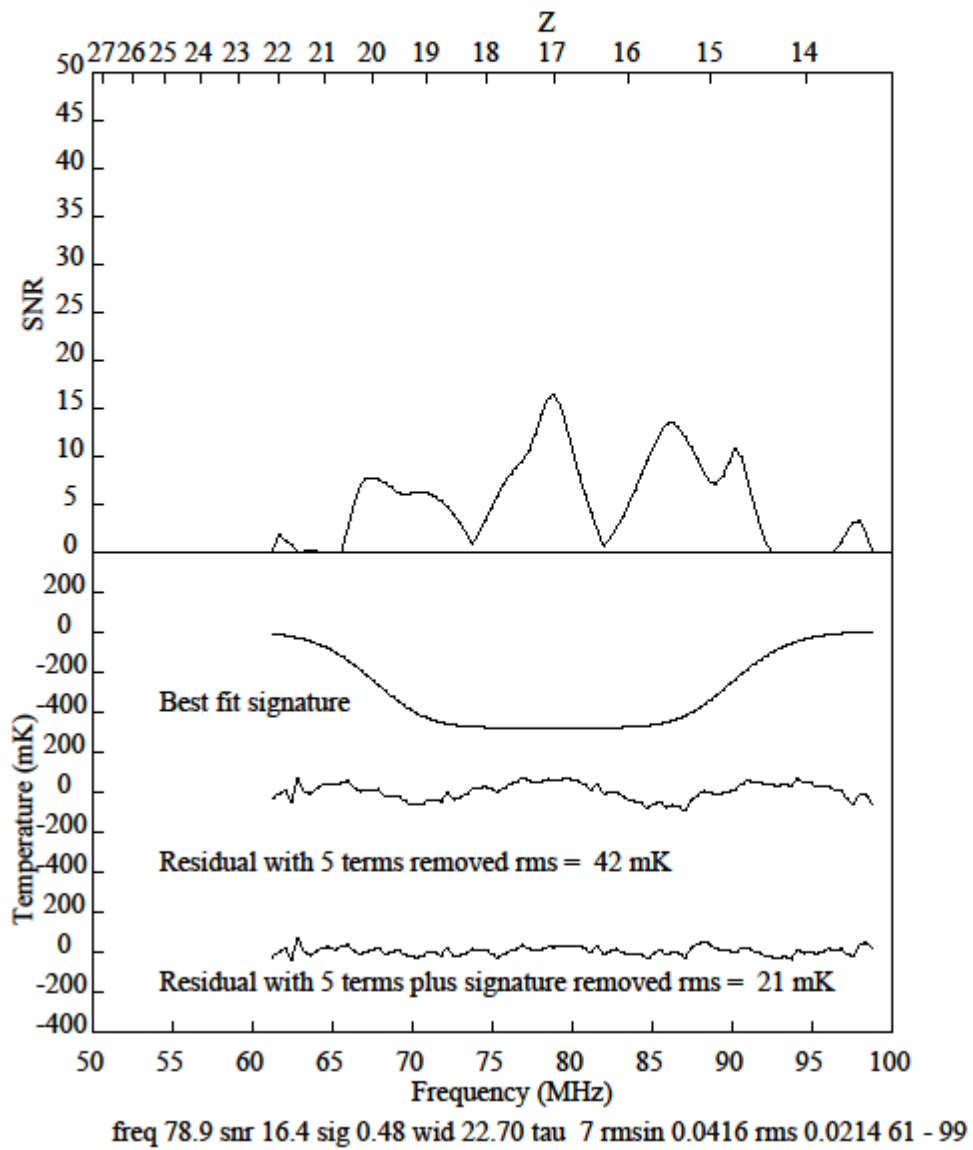Figure 4. Lowband2 using 2016 calibration at 15 C.

Figure 5. Lowband2 using 2016 calibration at 35 C.

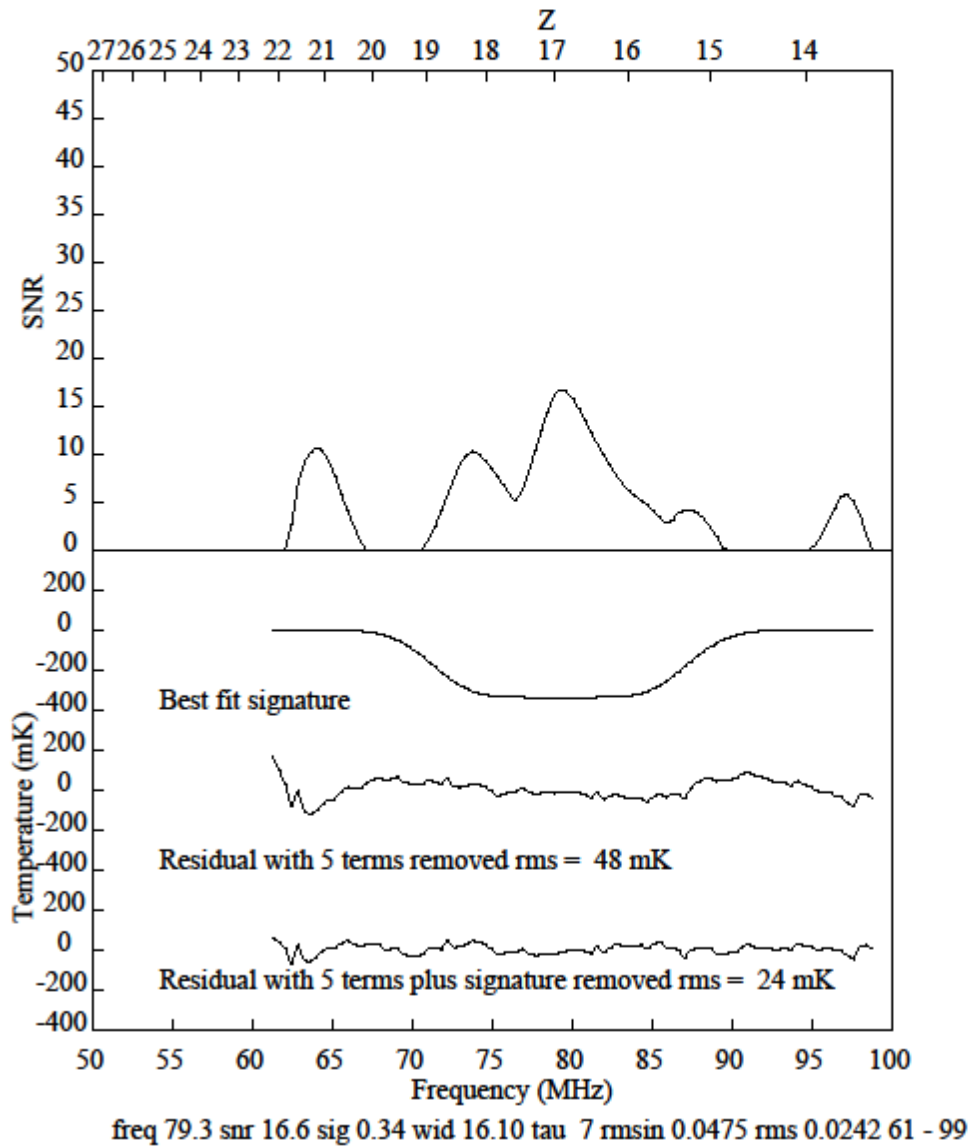freq 78.9 snr 16.4 sig 0.48 wid 22.70 tau 7 rmsin 0.0416 rms 0.0214 61 - 99
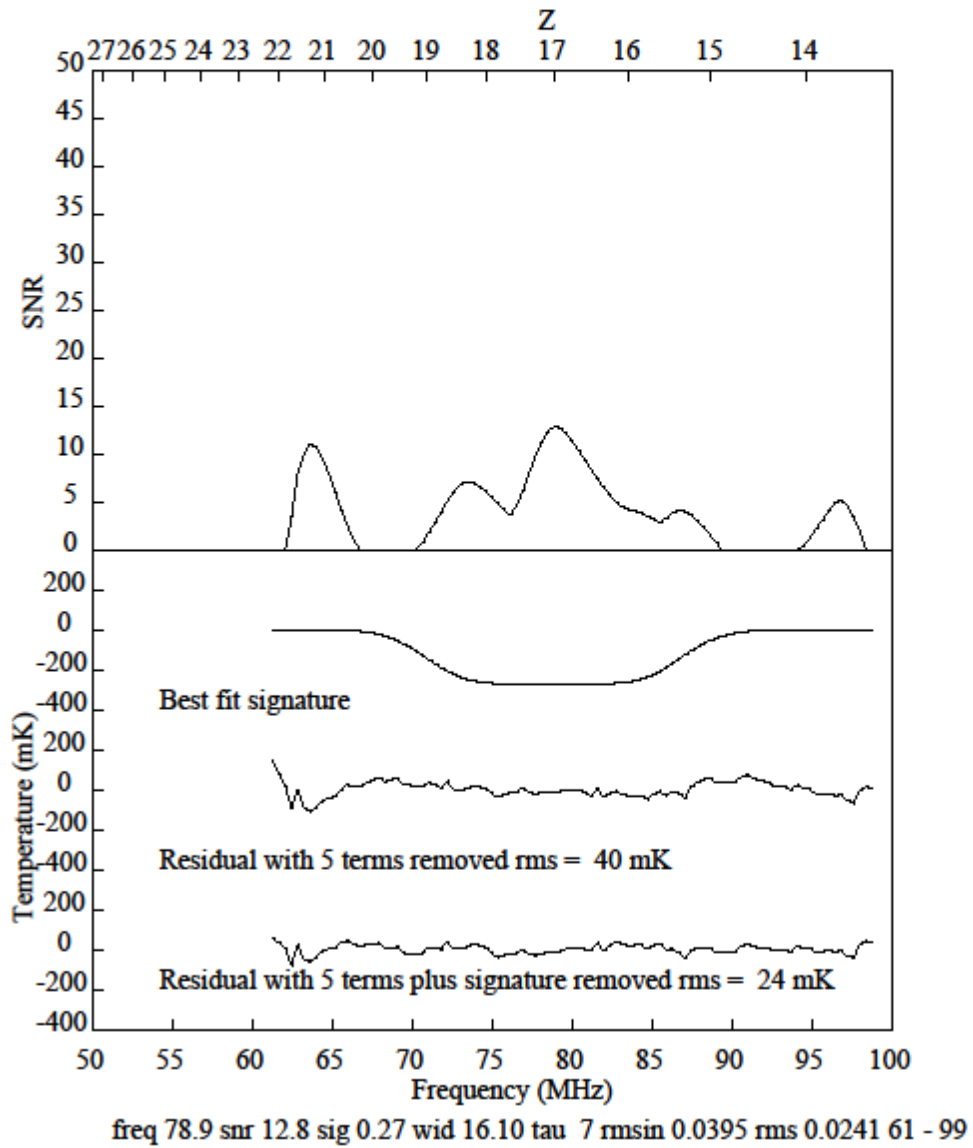
Figure 6. Lowband2 using 2017 calibration at 15 C.

Figure 7. Lowband2 using 2017 calibration at 35 C.