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March 25, 2024

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To: EDGES group

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Subject: 2018 feature subtraction test on EDGES-3 data from 2023 day 363 to 2024 day 80

An absorption feature subtraction test was made in Memo 441 using the 2018 feature with  $\tau = 4$  instead of the flattening  $\tau = 7$  reported in the Nature paper because EDGES-3 and midband give a higher SNR feature result with less flattening.

A test the subtraction of the 2018 result is now made using  $\tau = 7$  even though  $\tau = 4$  is within the error in  $\tau$  quoted in the 2018 Nature paper. This test is done using the 5 physical terms used in the Nature paper. Unfortunately, it is difficult to get down to 50 MHz with EDGES-3 to exactly match the same frequency range as in the Nature paper.

Figure 1 shows the absorption grid search without subtraction on the left and with subtraction on the right. While feature are derived the key result of this test shows that without the subtraction the rms residuals the 5-term fit to the sky temperature has bumps at about 67 and 94 MHz and is similar to that in Figure 1 of the Nature paper. The effect of the subtraction reduces the rms of the foreground from 72 to 40 mK.

Key parameters:

GHA range 06 to 18 hrs in 1 hour blocks

maxrmsf 200

maxfm 2000

sunlim -20

rfl 2.1

antaz 269

nfit4 12

aloss 0.01

soil conductivity  $2e-2$  S/m

Limiting data to times when the sun is more than 20 degrees below the horizon is discussed in memos 441 and 442. The parameters of the Haystack EDGES pipeline are listed in memo 387 and tests of the effects of systematics on several key parameter choices are listed and discussed in memo 441.

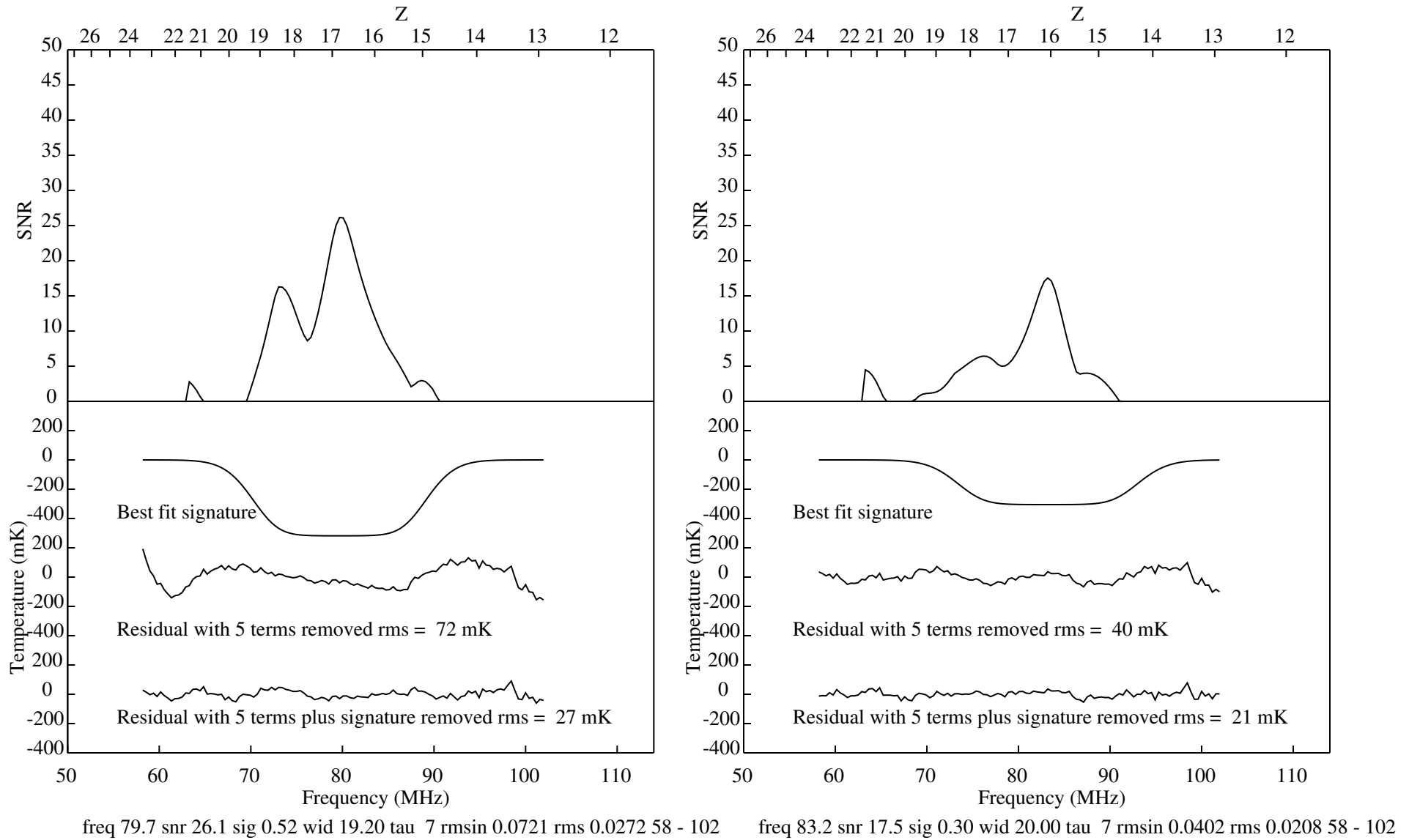


Figure 1. Grid search using data from EDGES-3 at WA 2023\_363 to 2024\_080. 5-physical terms are used for the foreground. The plot on the left is the grid search without the 2018 absorption result subtracted and the one on the right has the 2018 absorption subtracted.