

# LoCo Lab EDGES Memo 186

## Revisiting the Sky Observations from Nevada in 2014

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### 1 Description

In 2014, Tom Mozdzen and I measured the radio spectrum from the area surrounding the UNR Gund ranch in northern Nevada to have a reference for the RFI levels there. The details of the trip and measurements are in Haystack Memo 144.

Here we compute integrated spectra from the Nevada Low-Band data and show the residuals after removing a foreground model. The usefulness of this exercise is that the measurements were done: (1) from the northern hemisphere; (2) without a metal ground plane; and (3) with a Fourpoint Low-Band antenna.

Only relative calibration was applied to these data — i.e., using measurements of the internal ambient load and noise source, and assuming values for their noise temperature. No absolute calibration was applied. We do not have measurements of the S11 of the antenna or receiver, or of the receiver noise parameters. Neither beam correction nor ground loss correction were applied.

We conducted measurements on two days, at two spots. On day 1, the measurements were done with the dipole in NS orientation for one hour, and then in EW orientation for one hour. On day 2, the measurements were done at a different spot, in NS orientation, for one hour.

### 2 Results

Because the data are not fully calibrated, and to avoid the FM range, we chose to focus on the frequency range 62 – 87 MHz. We fitted 4- and 5-term LogLog polynomials to the integrated spectra. We also added an absorption term to the 5-term LogLog model to see its effect on the residuals.

The results are summarized in the following pictures and figures.



Figure 1: Measurements at site 1.



Figure 2: Measurements at site 2.



Figure 3: Measurements at site 2.

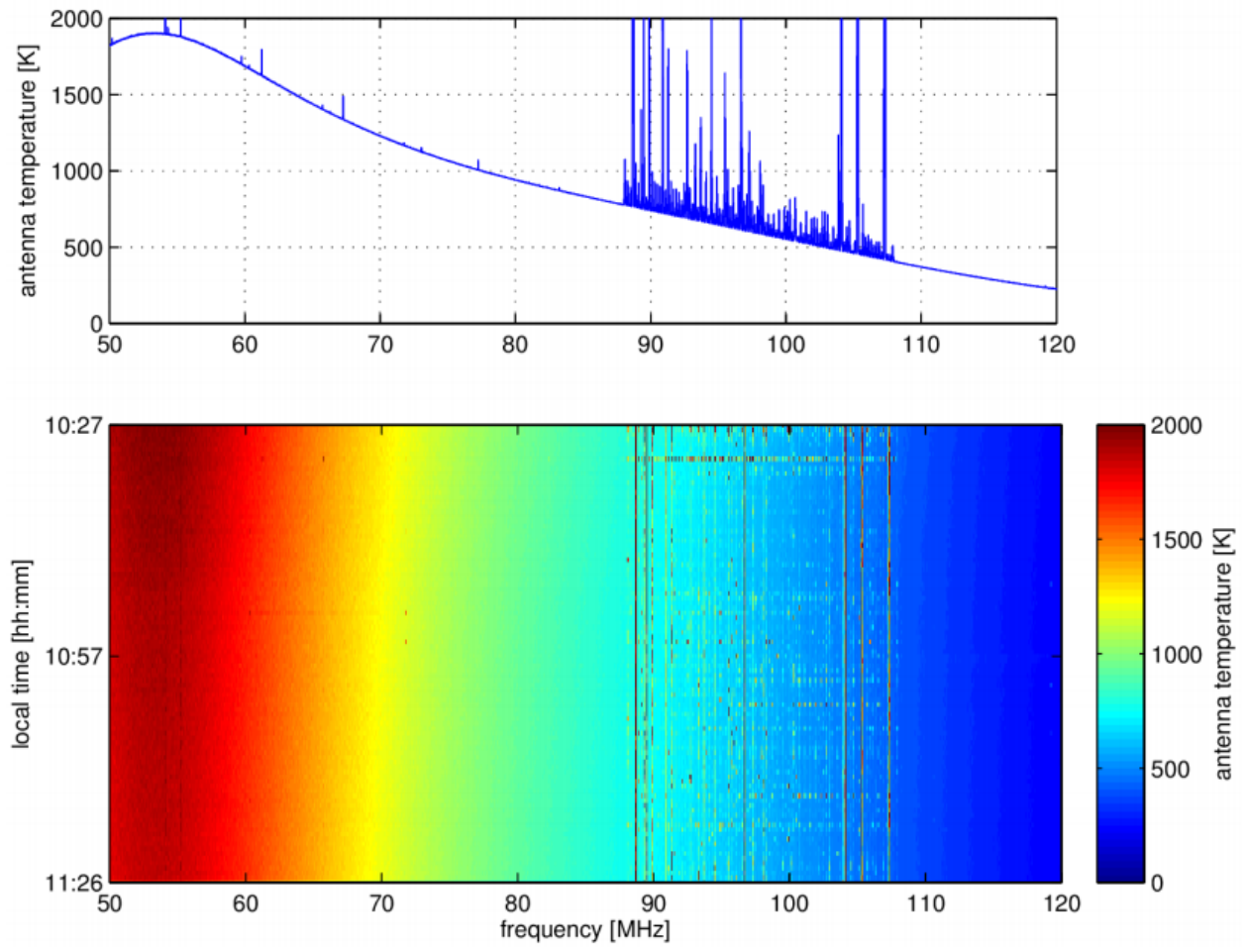


Figure 4: NS measurements from site 1.

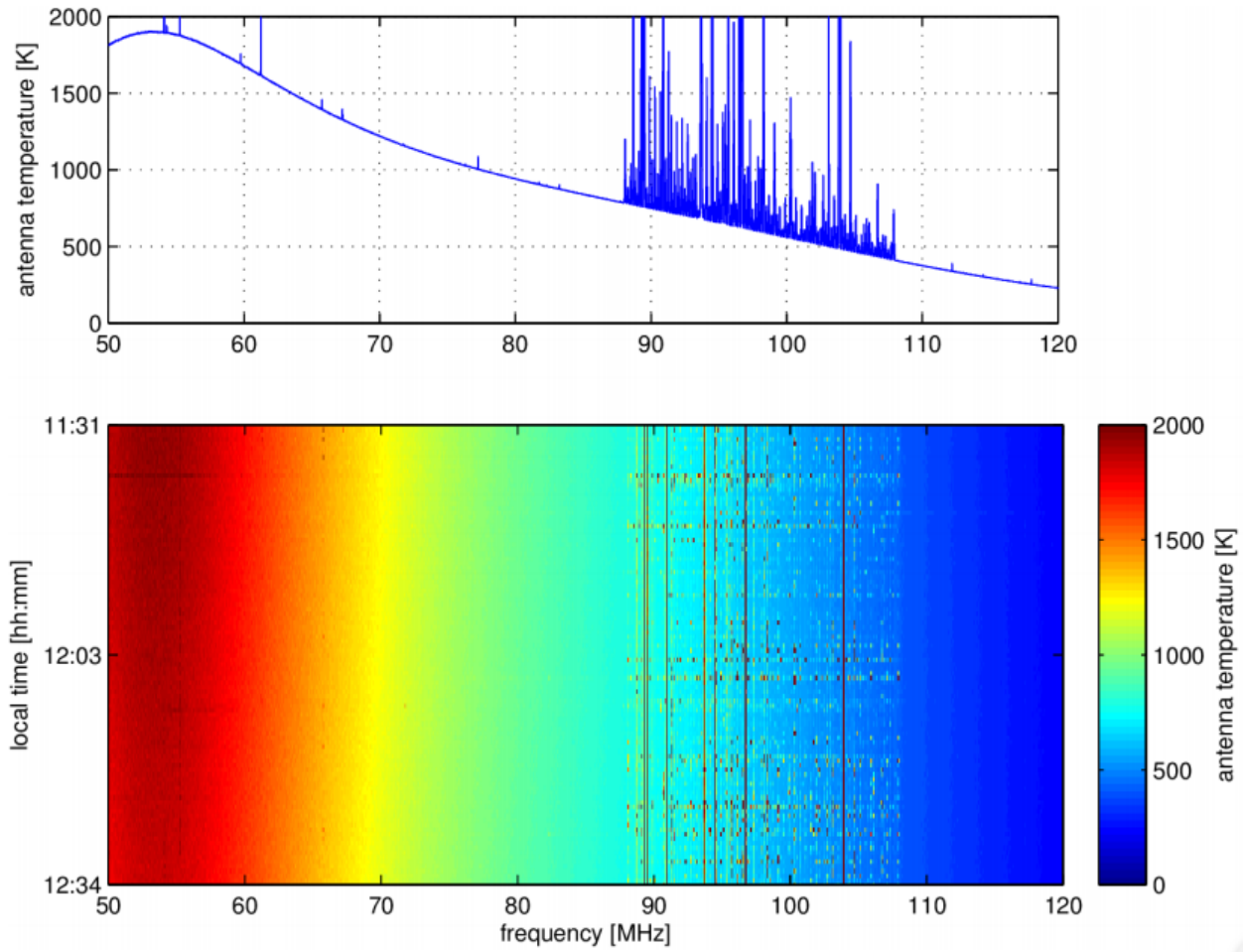


Figure 5: EW measurements from site 1.

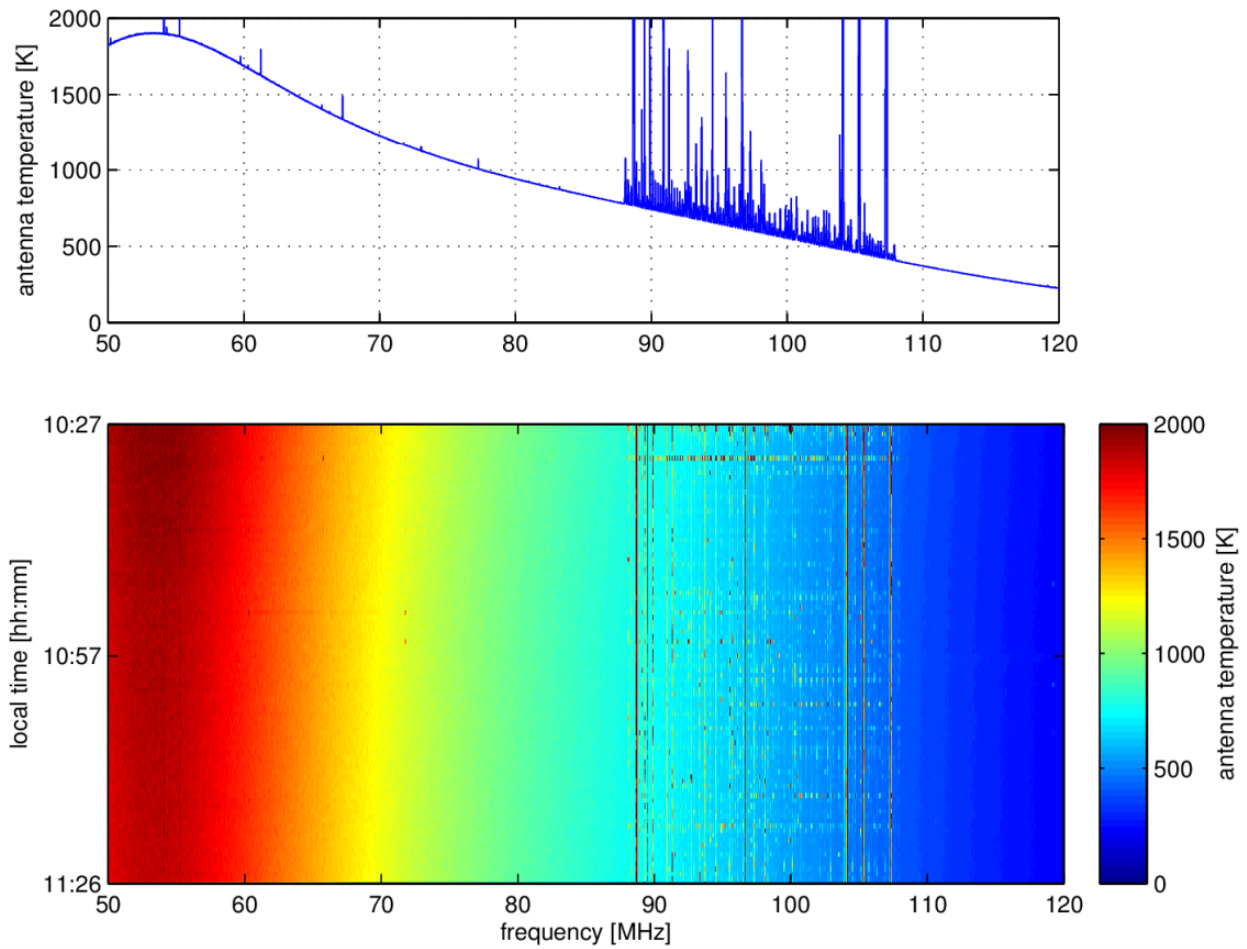


Figure 6: NS measurements from site 2.

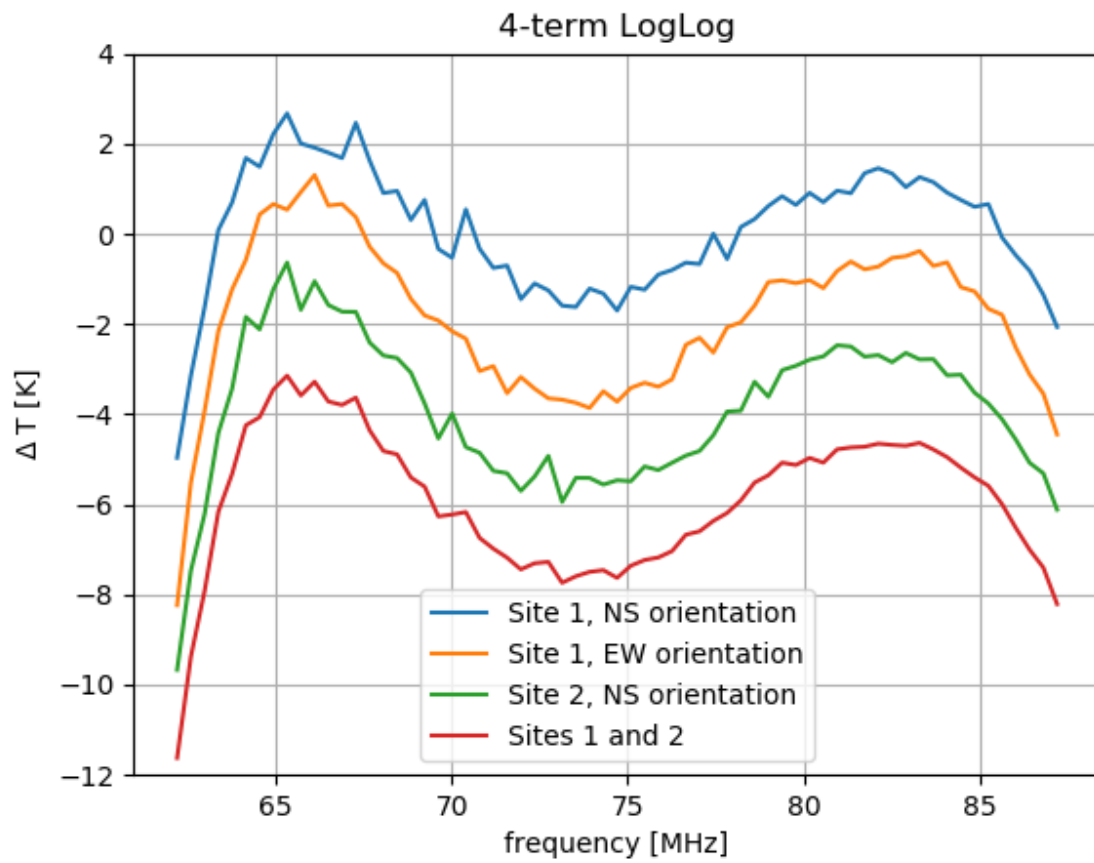


Figure 7: Residuals when modeling the data with a 4-term LogLog model.



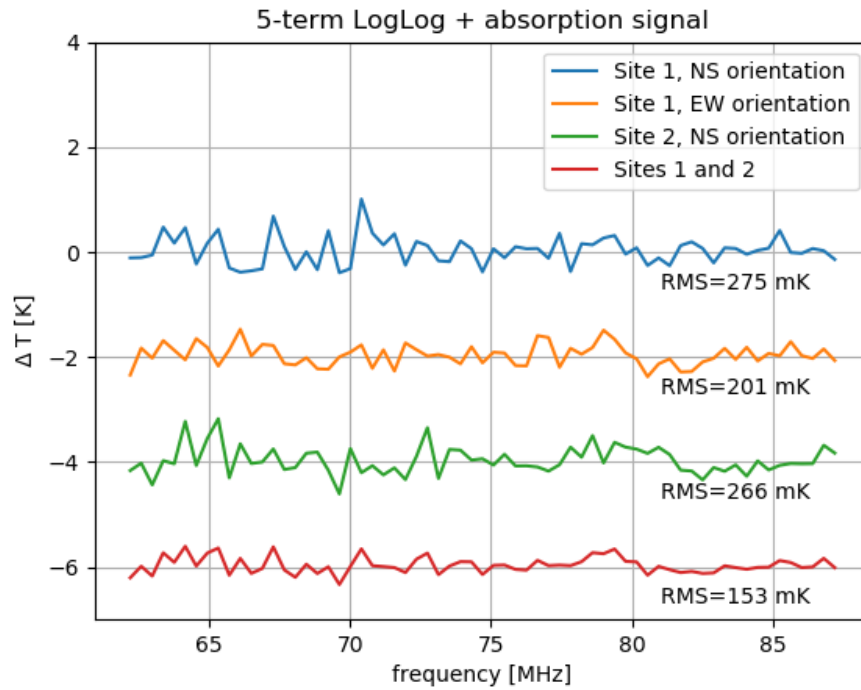
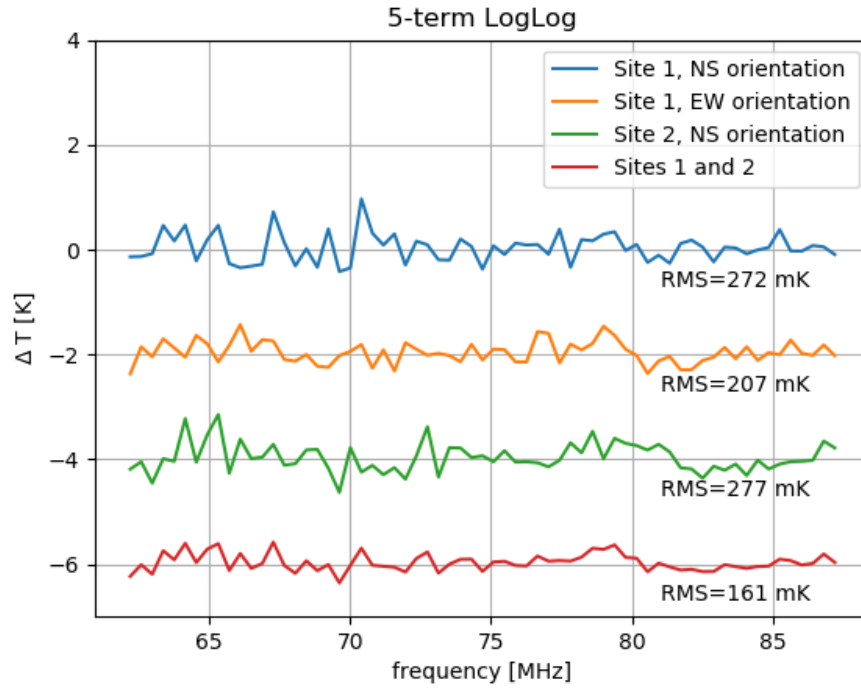


Figure 8: (TOP) Residuals when modeling the data with a 5-term LogLog model. (BOTTOM) Residuals when modeling the data with a 5-term LogLog model plus an absorption term equal to the best-fit in Bowman et al. (2018).

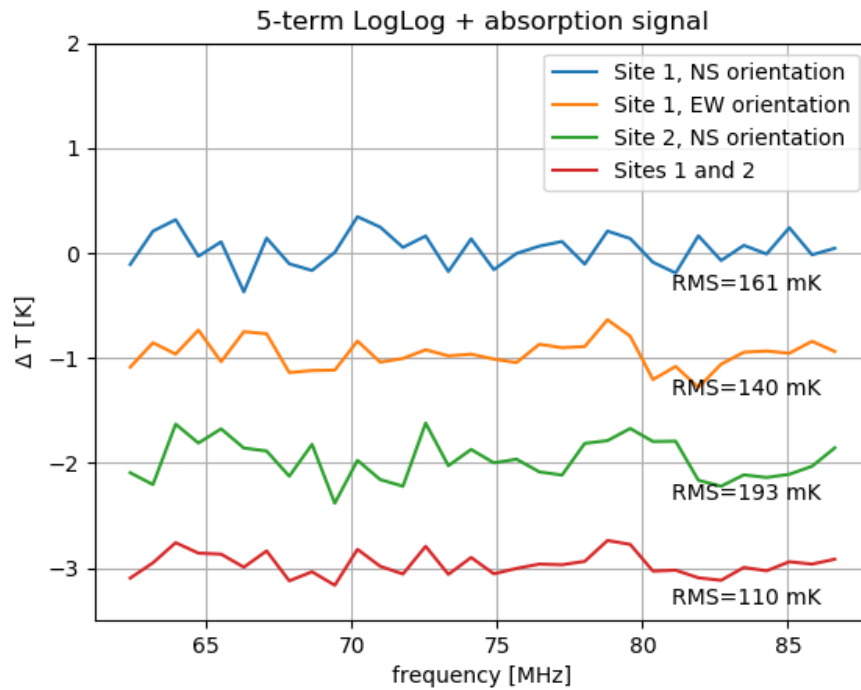
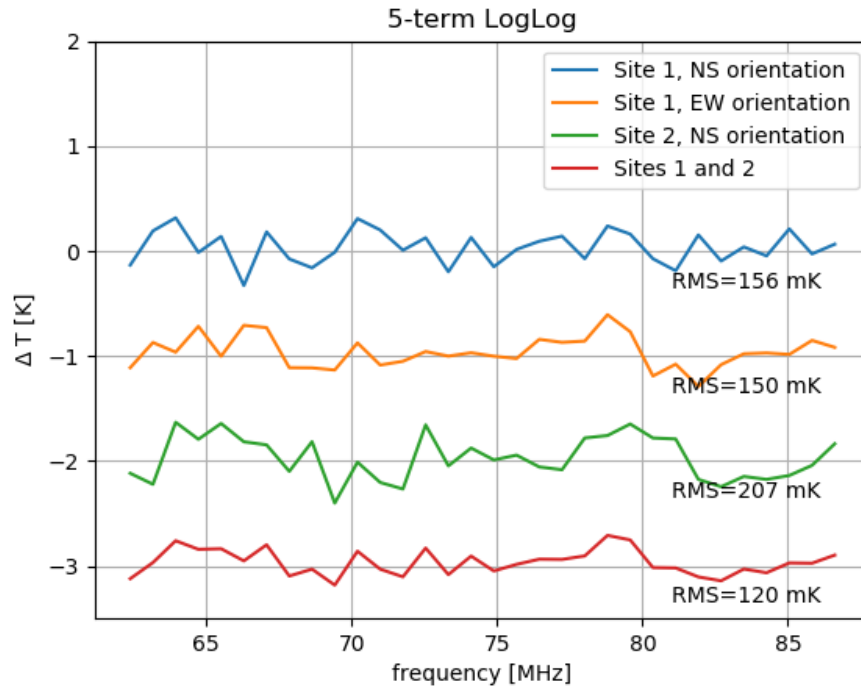


Figure 9: Same as Figure 8, but binning the data at 780 kHz (rather than at 390 kHz as in Figures 7 and 8). Note the different vertical separation between the lines compared to Figure 8 (1 vs 2 K), and the lower RMS values.