

Recalibration of Lowband Receiver 01 25C

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Introduction

- Here we show the calibration results for the Low Band 1 receiver at 25°C.
- The specific calibrations considered correspond to Low-Band 1 receiver done in 2019_11.
- The calibration coefficients were estimated for the frequency range:
 - 50-190 MHz.
- As a precaution, in order to avoid periods of instability of the calibrators, we remove ~ 5% of the data at the beginning of each period covered by the listed spectra files.

Files used:

/data5/edges/data/Receiver01_2019_11_26_040_to_200/25C

s11:

/data5/edges/data/Receiver01_2019_11_26_040_to_200/25C/

S11/

Note: The s11's used in this report were the first measurement in each set.

Standards used:

Male standard - Maury Kit - 50.17ohm (25 degC)

Female Standard - EDGES Keysight - 50.0045ohm (25 degC)

Temperature of calibration loads @ 25C

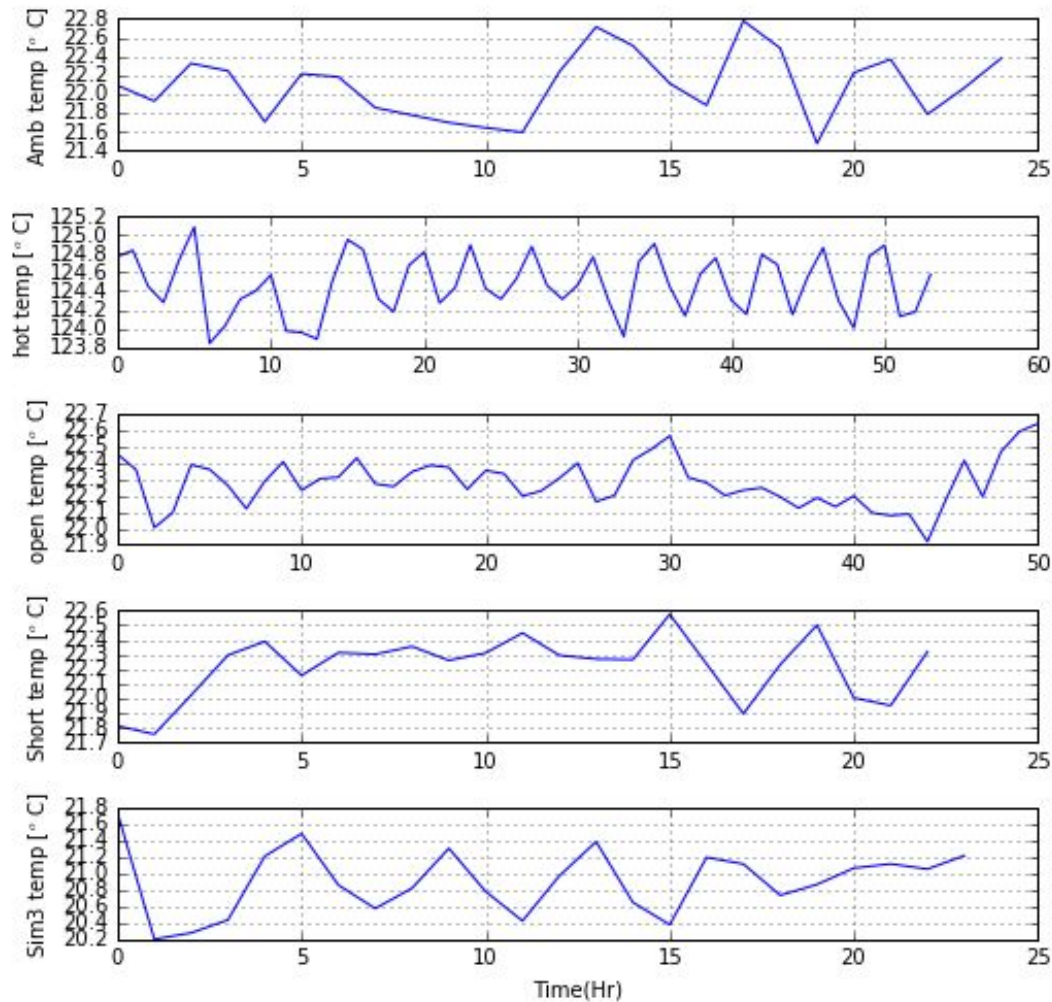


Figure1: Temperature of the calibration loads and antenna simulator 3.

Spectra data @ 25C for the loads

11/26/2019

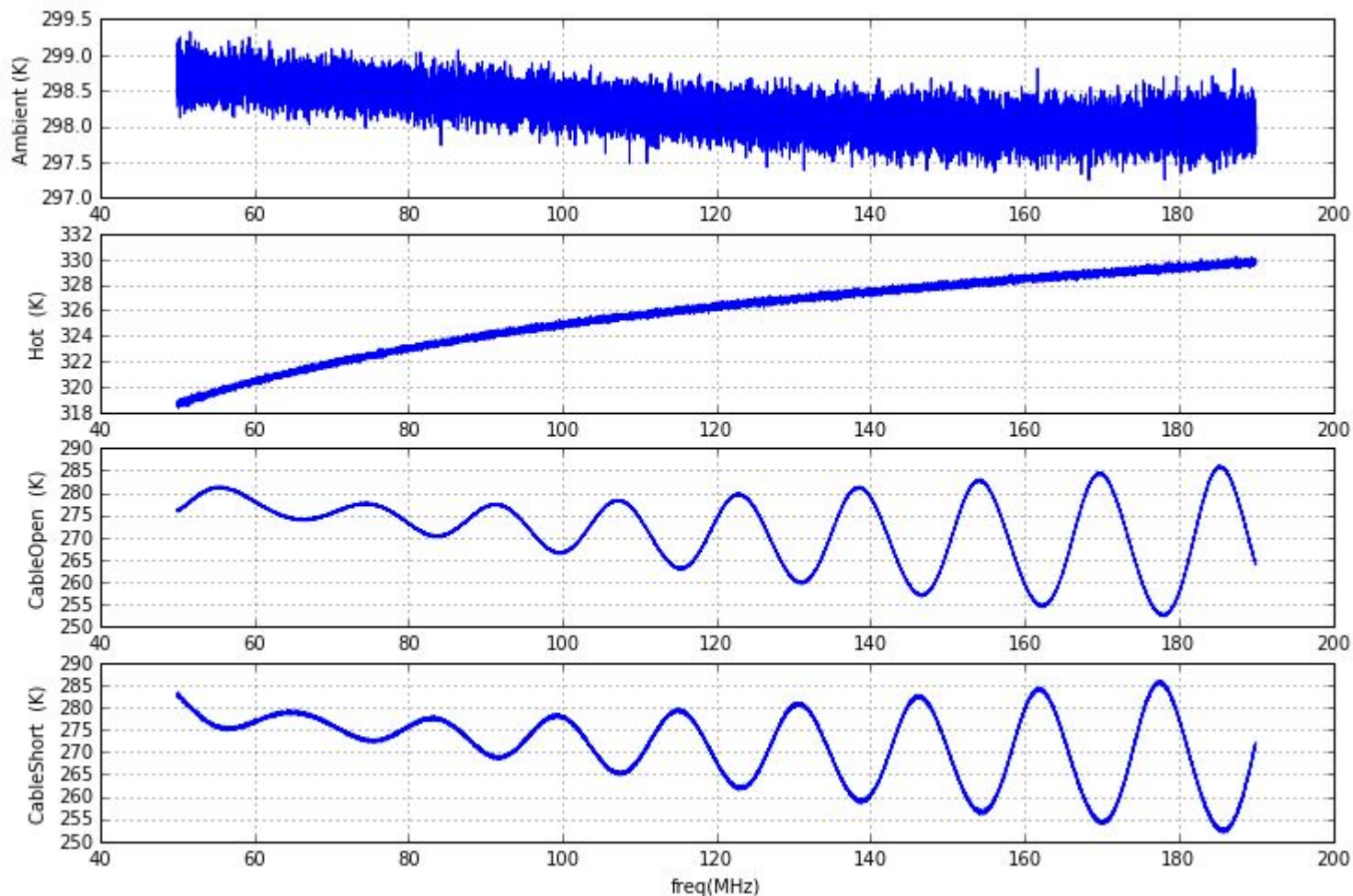


Figure2: Raw spectra of the calibration loads. Spectra looks clean without any RFI

Spectra data @ 25C for the loads

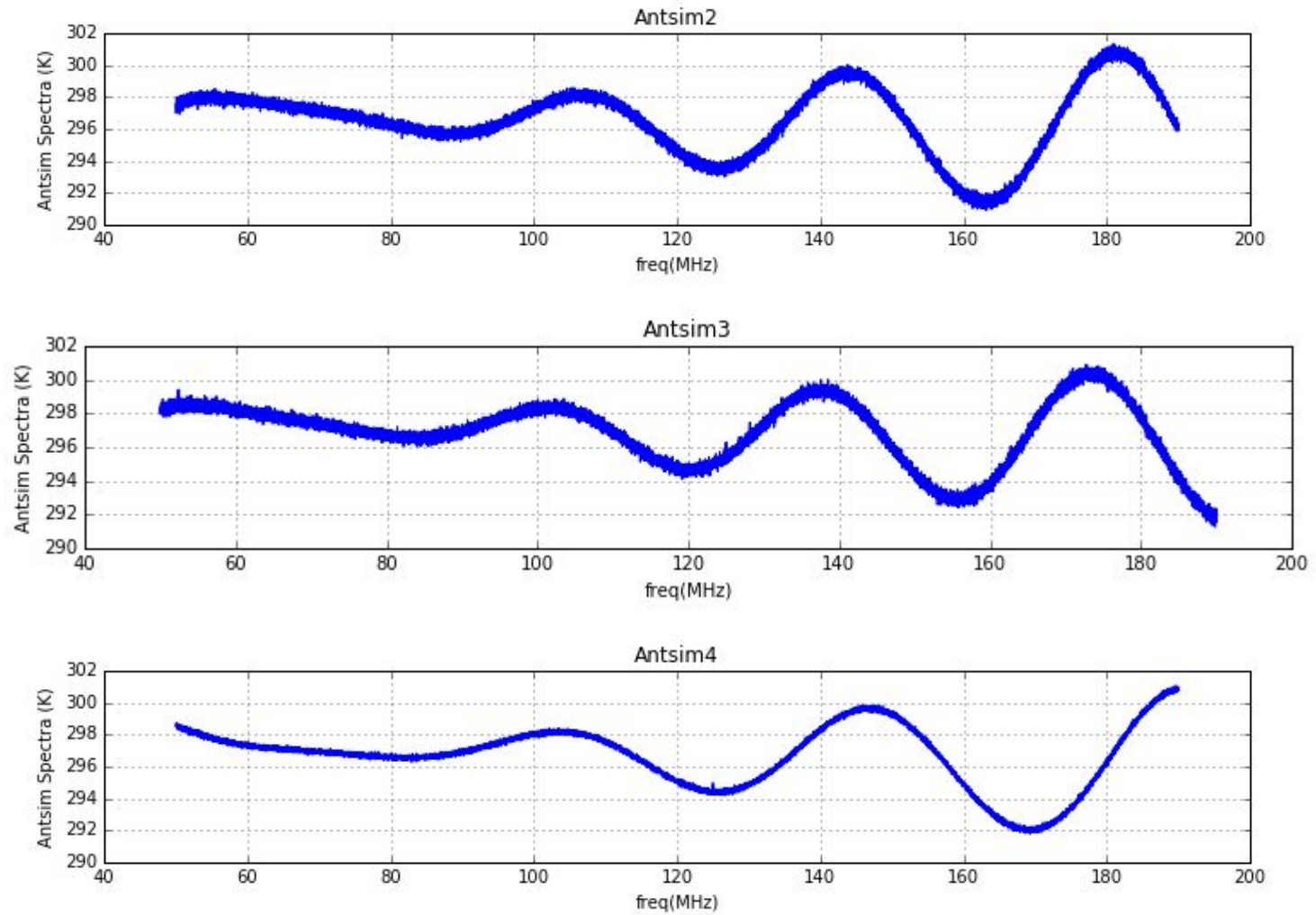
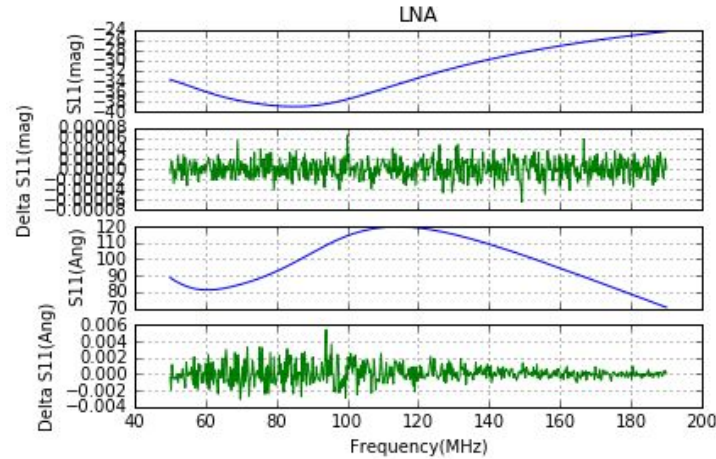


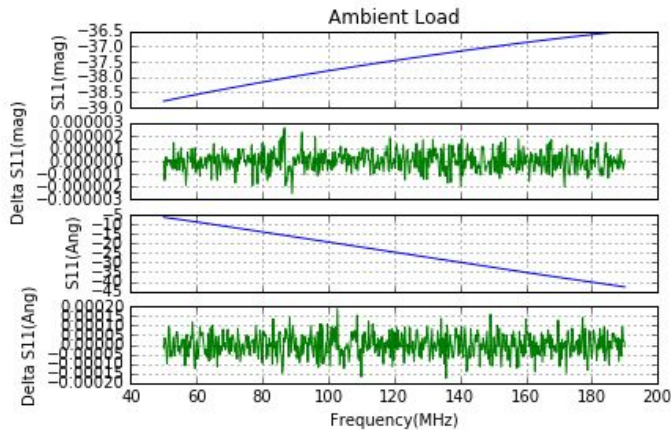
Figure2b: Raw spectra of the calibration loads. Spectra looks clean without any RFI

Reflection coefficients of the loads @25C; Freq: 50-190MHz

47 polynomial terms



37 fourier terms



37 fourier terms

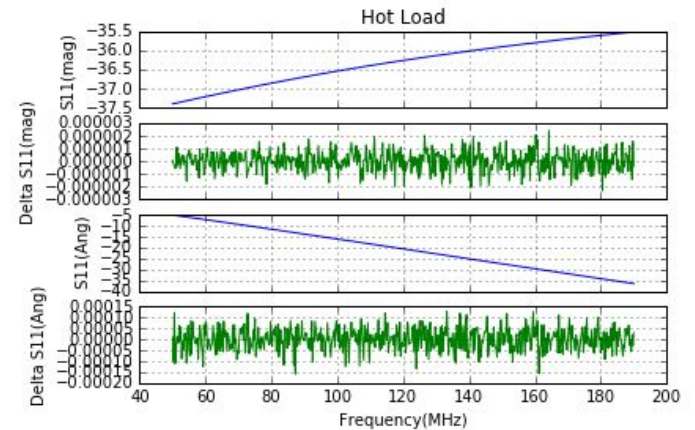


Figure3a: Reflection coefficients of the LNA and the calibration loads. Blue is the fit to the S11s (mag & phase). Green is the difference between the fits and the actual measurements for each respective case.

Reflection coefficients of the loads @25C

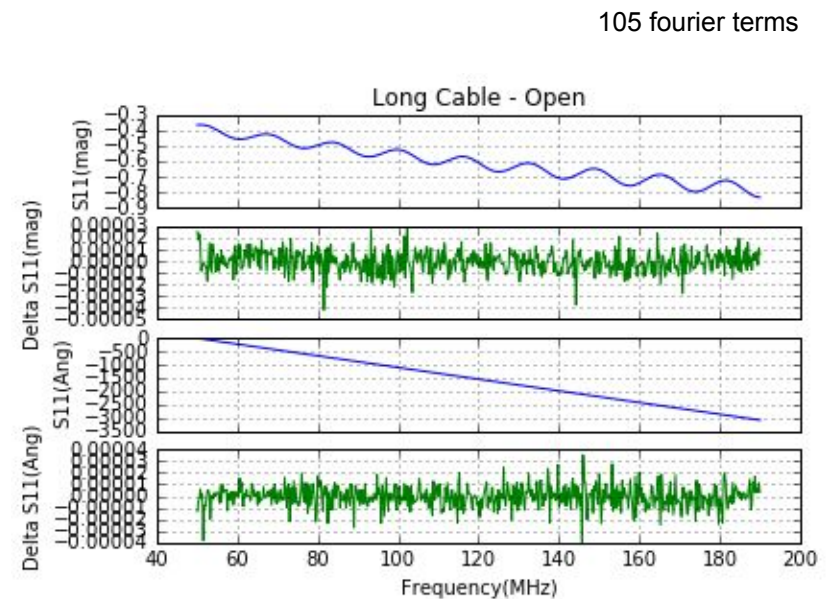
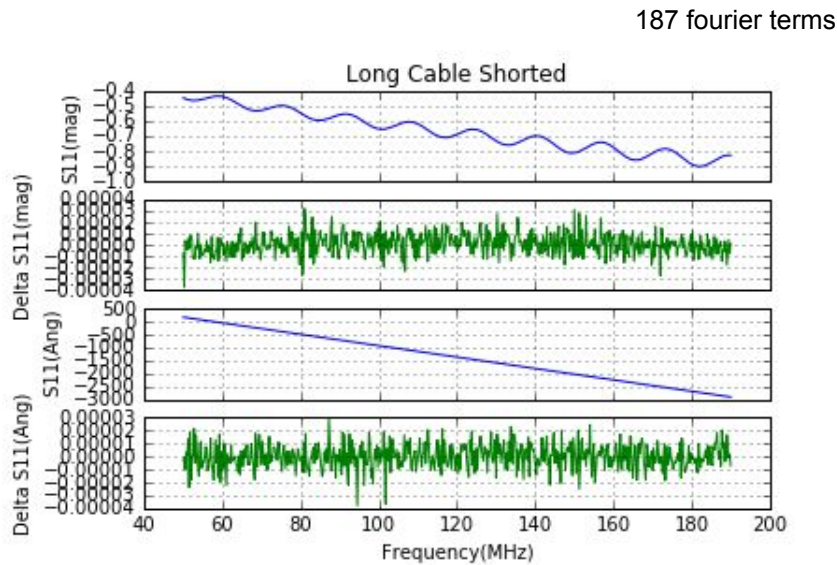


Figure3b: Reflection coefficients of the long cables. Blue is the fit to the S11s (mag & phase). Green is the difference between the fits and the actual measurements for each respective case.

Reflection coefficients of the loads @25C

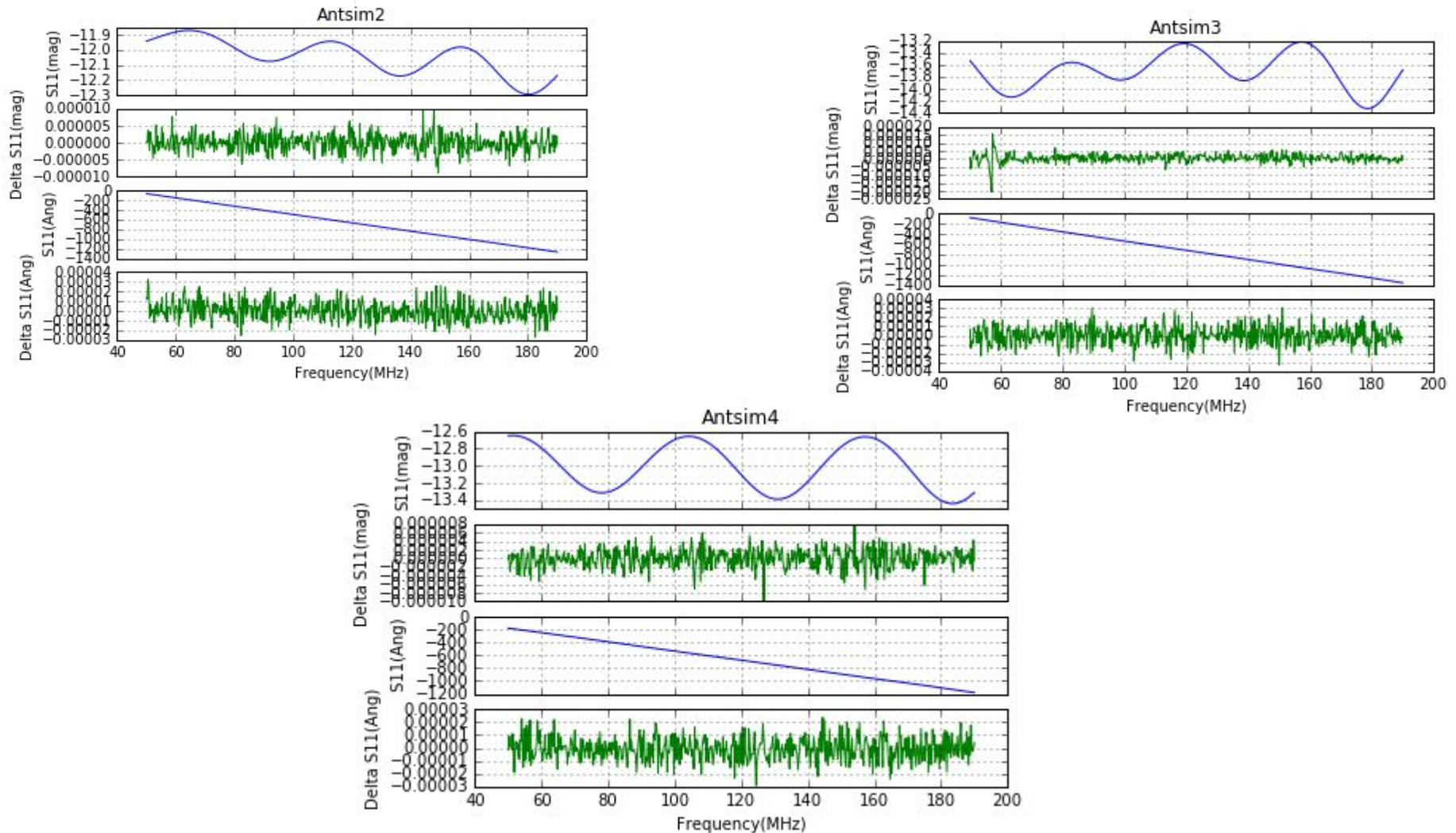


Figure3c: Reflection coefficients of the long cables. Blue is the fit to the S11s (mag & phase). Green is the difference between the fits and the actual measurements for each respective case.

Cal coefficients derived from 25C; Freq: 50-190MHz

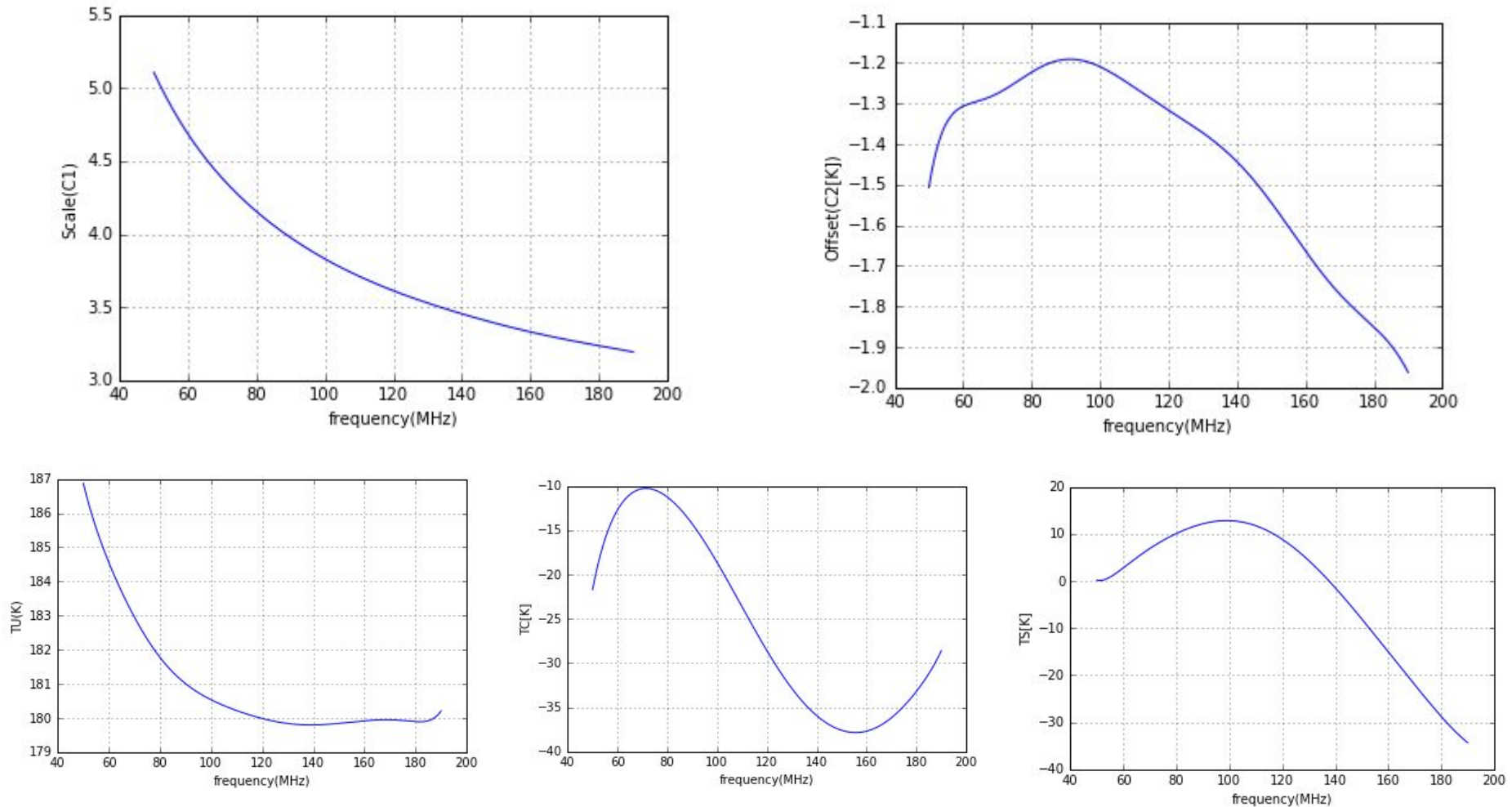


Figure4: Calibration parameters for the Low-Band 1 receiver. Over 50-190 MHz, we use 10 terms to model C1 & C2 and 12 terms to model Tu, Tc, Ts.

Calibration Cross check for 25 C; Freq: 50-190 MHz (w/ Ant_sim2)

Case1 - 10 terms for constants and 12 terms for noise wave parameters

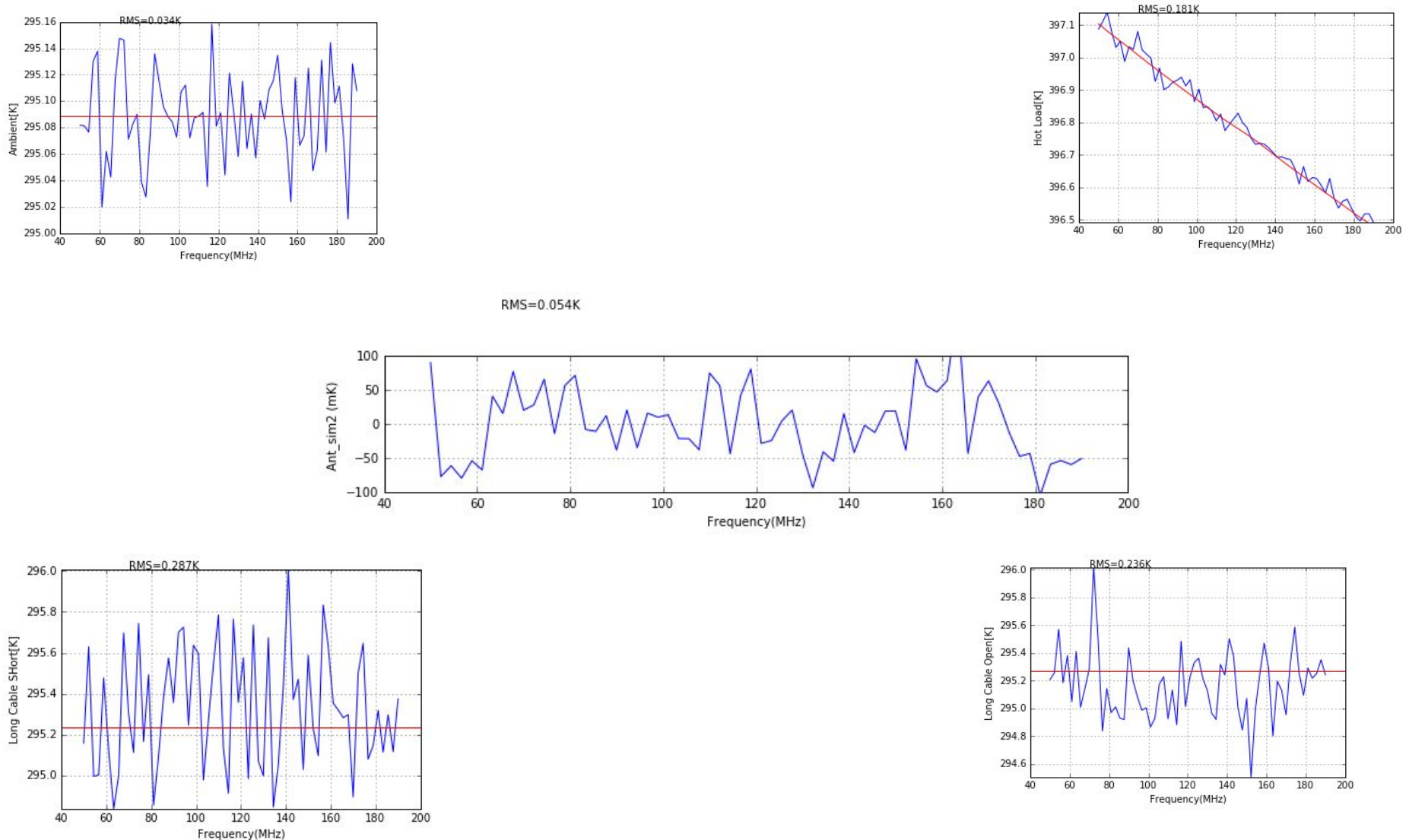


Figure5a: Cross checks for calibration of Low-Band 1, 2019-11.

Calibration Cross check for 25 C; Freq: 50-190 MHz(w/ Ant_sim3)

Case1 - 10 terms for constants and 12 terms for noise wave parameters

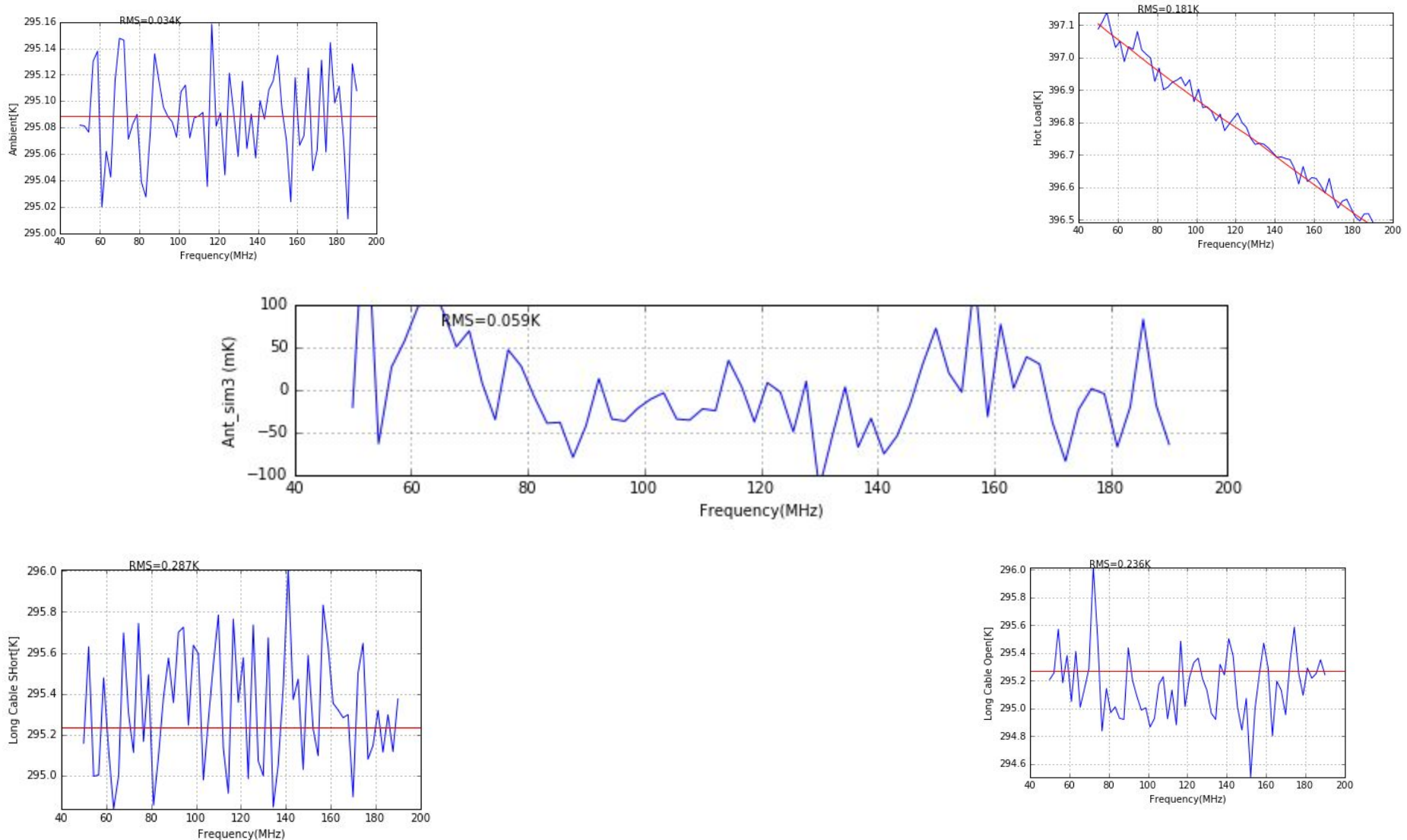


Figure5b: Cross checks for calibration of Low-Band 1, 2019-11.

Calibration Cross check for 25 C; Freq: 50-190 MHz(w/ Ant_sim4)

Case1 - 10 terms for constants and 12 terms for noise wave parameters

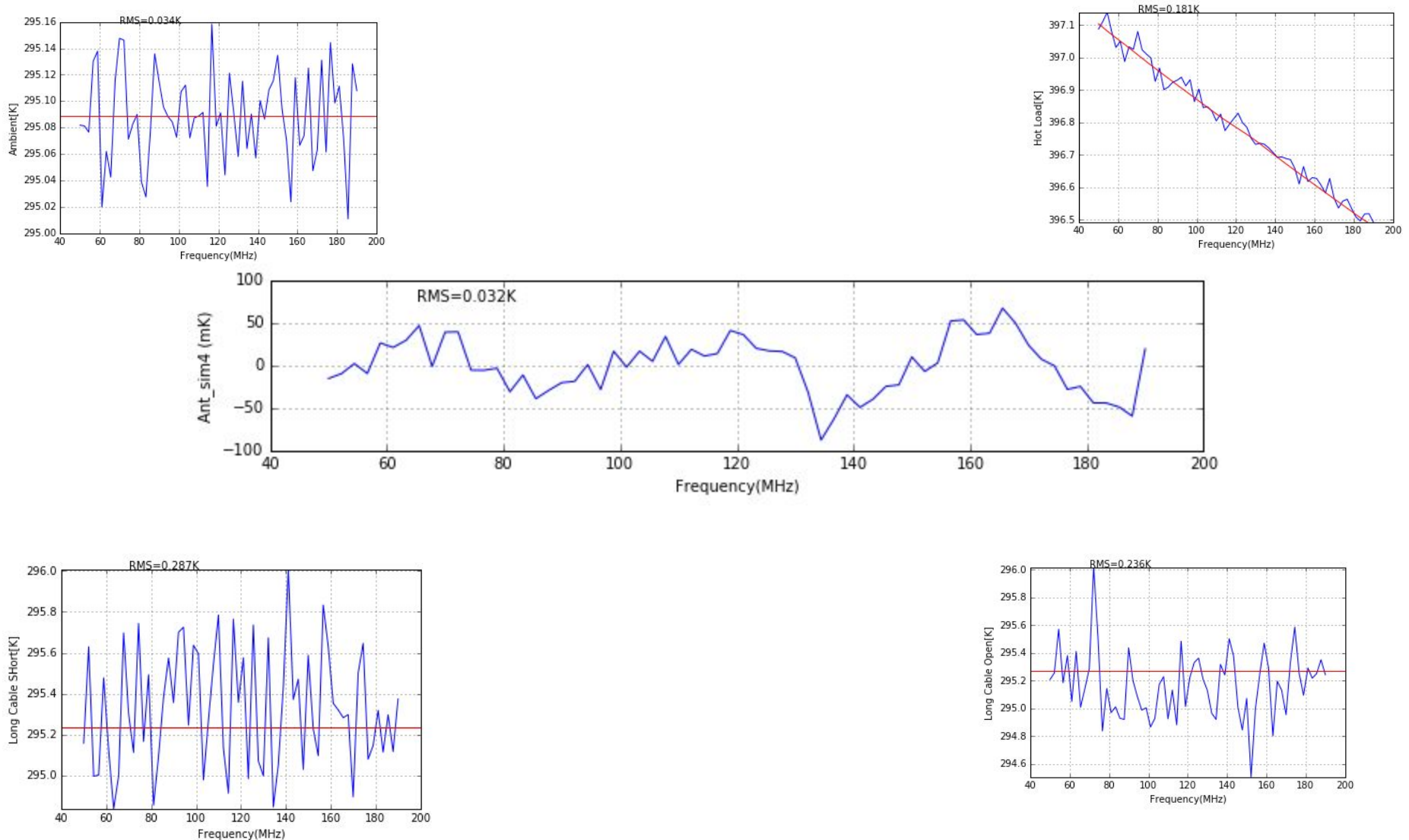


Figure5c: Cross checks for calibration of Low-Band 1, 2019-11.