Receiver 01 Re-calibration

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The receiver01 that was connected to the midband system was back from the site in MArch 2019. The receiver was recalibrated to make sure the coefficients had not changed during the data collection period. This was done as a verification as the midband data is currently being analysed.

The calibration was started in March 2019. Receiver01 was connected to backend A (the back end that was brought back from the field and not the back end that is traditionally used in the lab. Also the same back end that was used to confirm the 60 MHz dip seen in ANS#2 when connected to Rcv#2). ***File: Receiver1_25C_2019_03_27_040_to_200_MHz/25C***

On looking at the individual load spectra, A ripple was seen around 60 MHz.

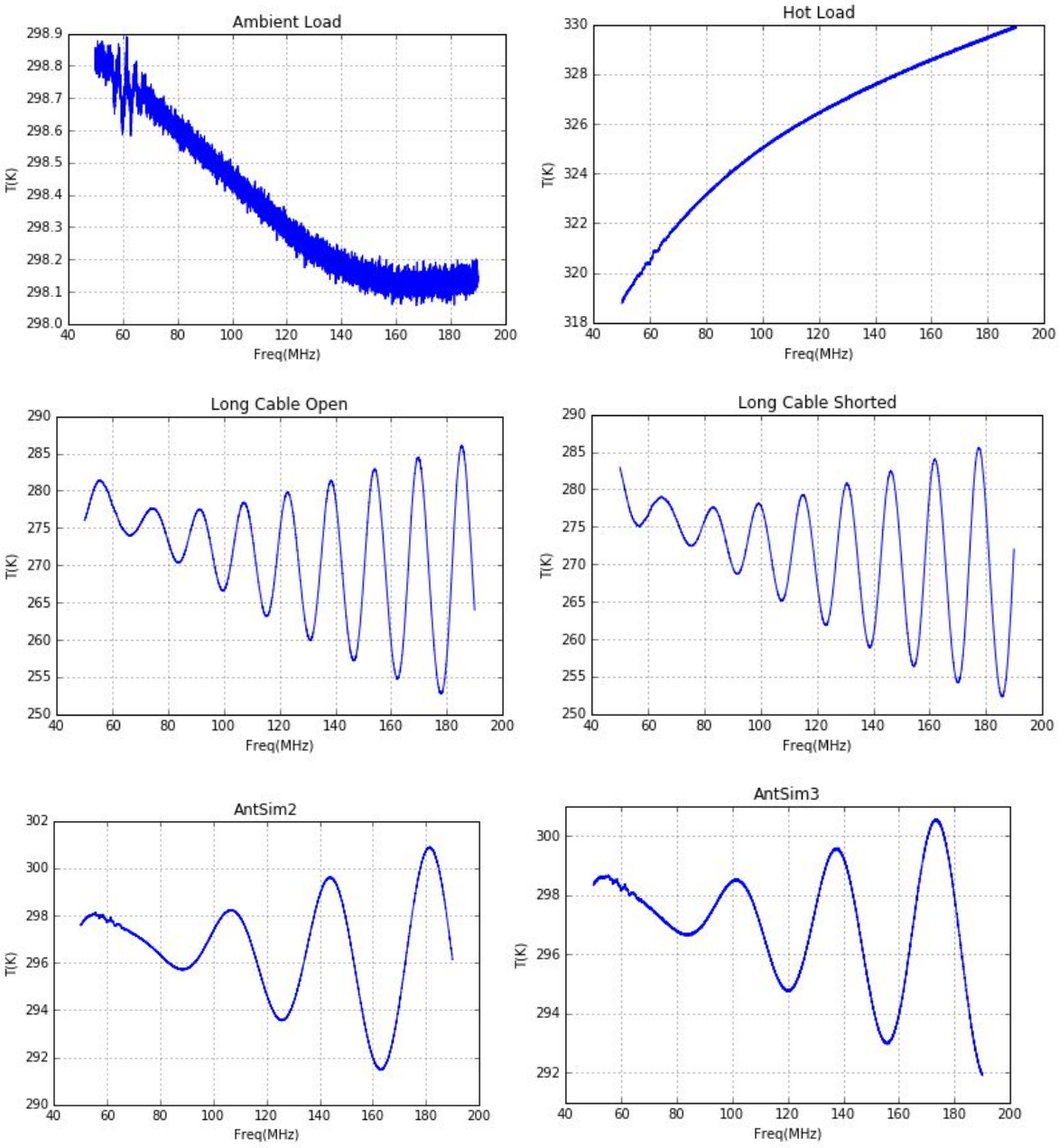


Figure1: Uncalibrated spectra vs Freq of the individual standard loads collected with Rcv#1 and backend A. The ripple is present in all the spectra. In the cable spectra it is not quite visible just because of the wide range of the scale.

The S11 of the individual loads were also examined:

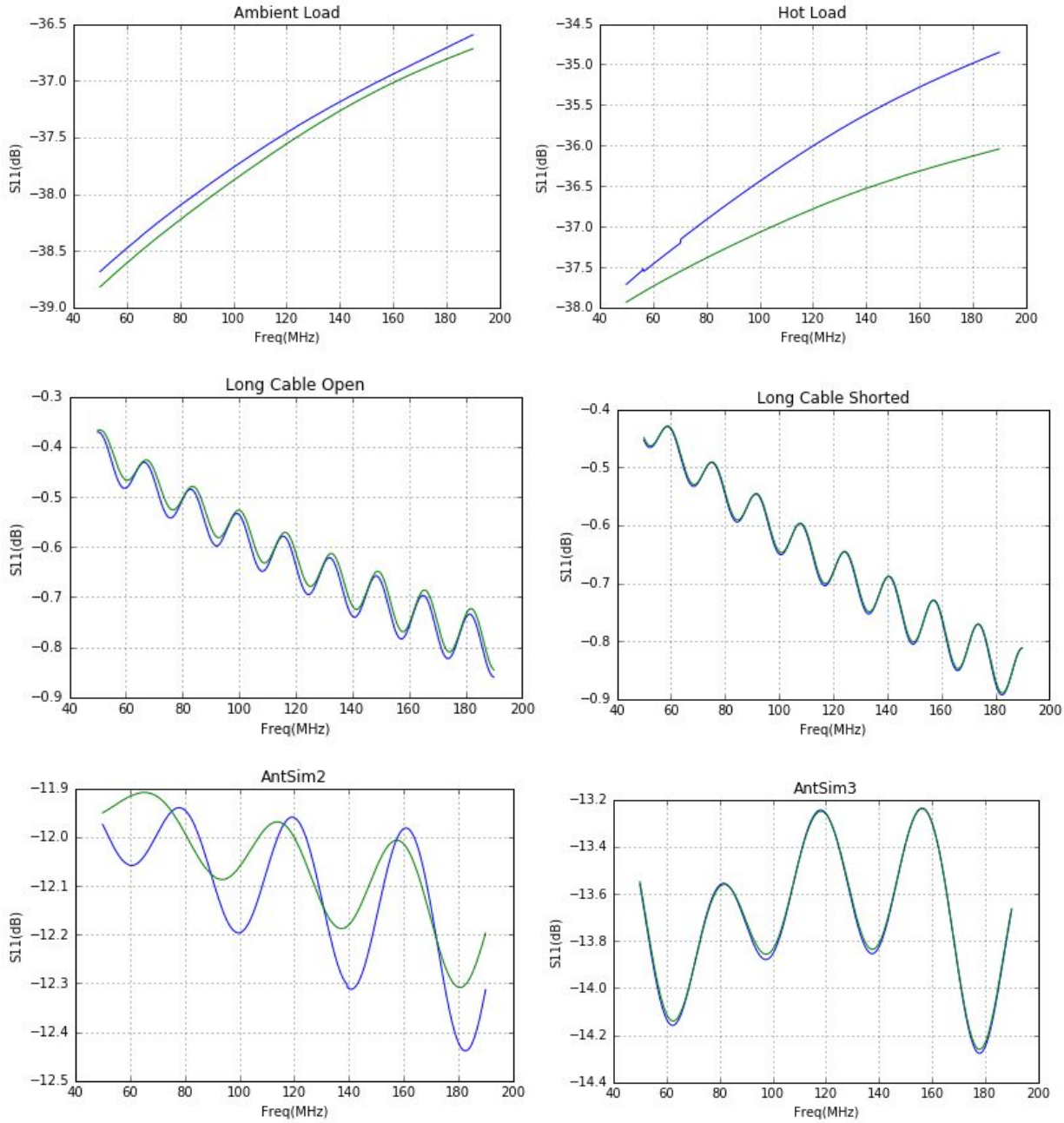


Figure2: S11 Vs Freq for all the loads. The two curves in each plot corresponds to the two repeats of the same measurement.

It can be seen from the above plots that the two measurements of the Hot load and the Antsim2 did not match.

The whole measurement was redone. The spectra was recollected by switching the backend to the one that is usually used in the Lab (backend B). ***File: Receiver1_25C_2019_04_10_040_to_200_MHz/25C.*** The Spectra of the individual loads are shown below:

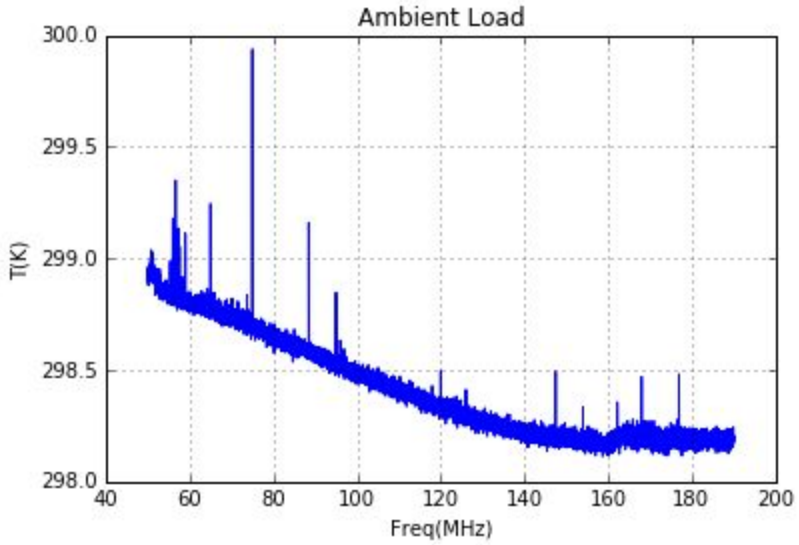
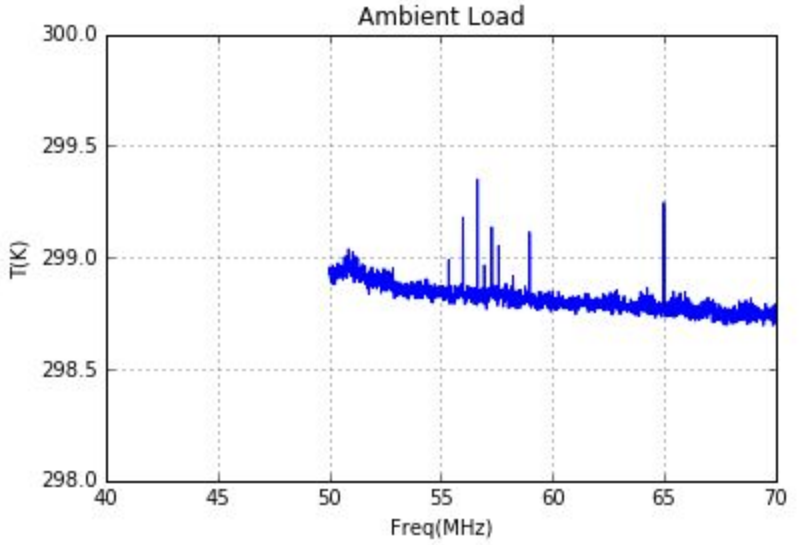
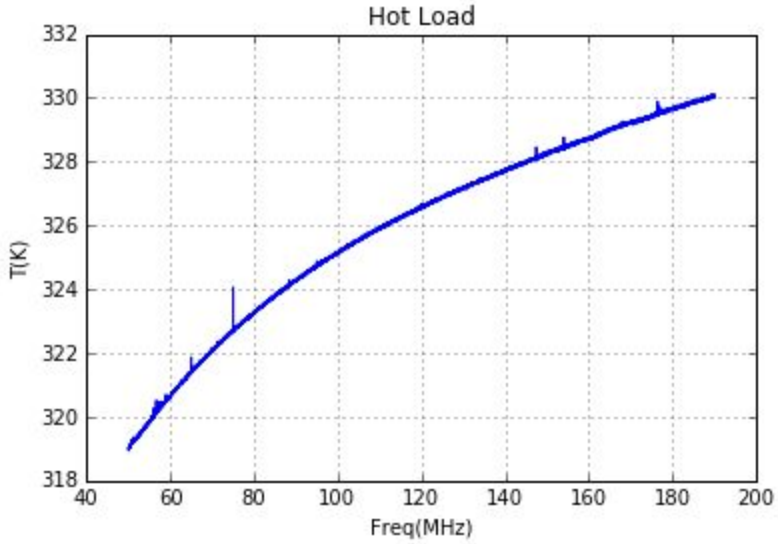


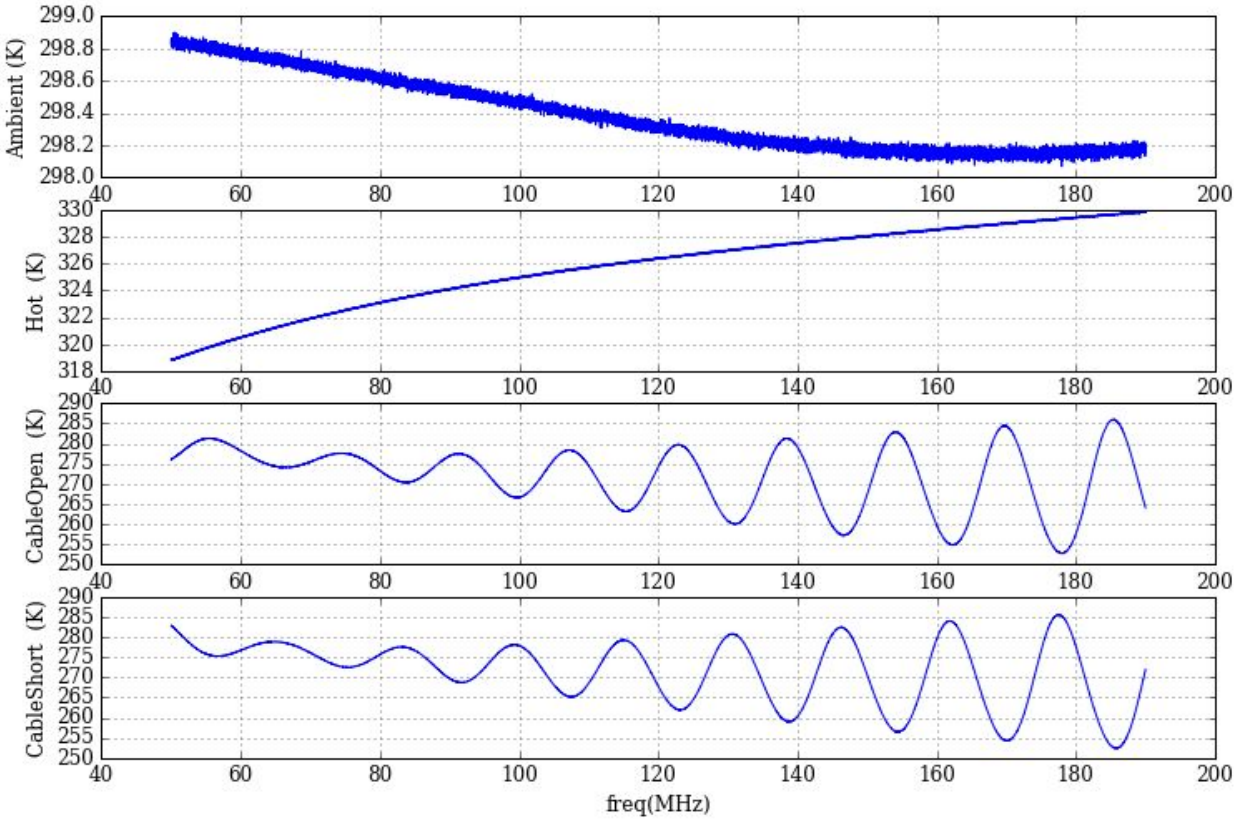
Figure3: Uncalibrated spectra vs Freq for the ambient load collected with Rcv #1 and the backend B.

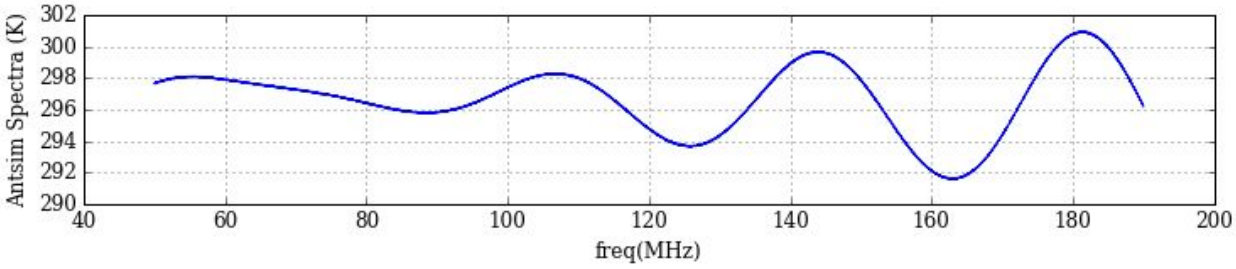
There is too much RFI. Two days of spectra was collected and the RFI is seen in both the individual spectra. But on zooming in, there is no evidence of the 60 MHz ripple:



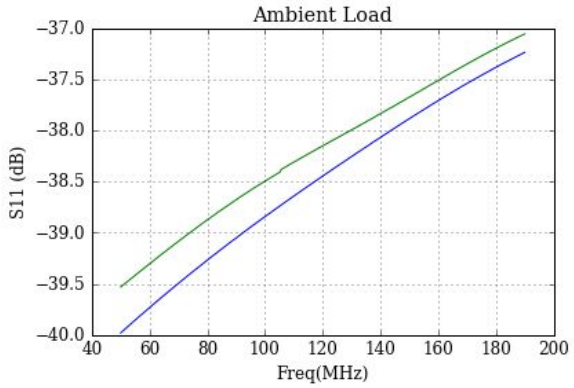


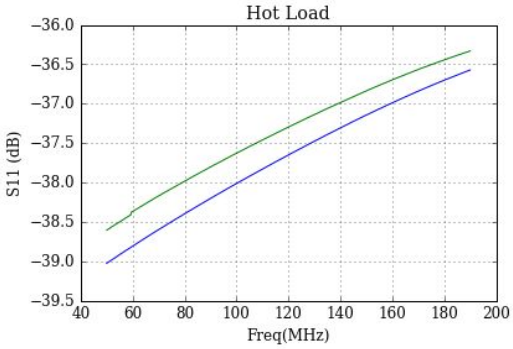
The RFI was due to the improper connection between the load box and receiver via the SMA connected. This was fixed and the raw spectra looks clean as shown below:

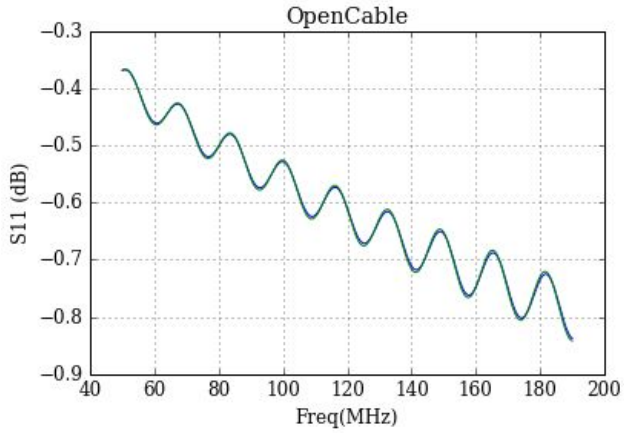


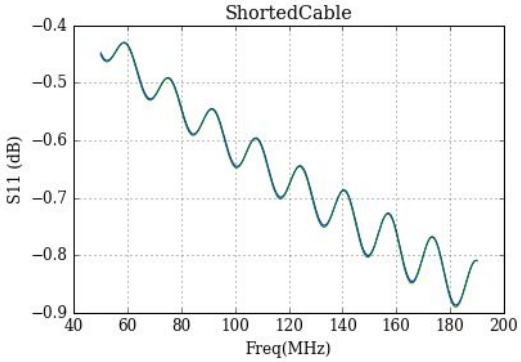


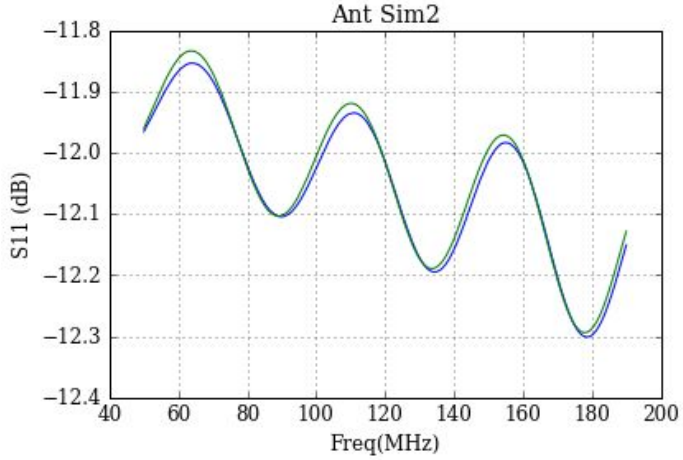
The S11 was also inspected and they looked consistent between the two individual repeats for each load.











To solve the 60 MHz ripple issue with back end A, we reconnected Back end A and obtained the ANS spectra with RCV01 & RCV02. The attenuator on the backend was tightened for this measurement. Expecting no ripple.

The ANS spectra collected with rcv2 was calibrated using the cal coeffecients from 2018. And the residues to the calibrated spectra is plotted below. No ripple is seen but the residues are high indicating a 6dB attenuator was not used for this measurement.