

Testing for Crosstalk in Lab VNA

Nivedita Mahesh
ASU

In this report we use a couple of different lab measurements of Rcv01 to check for the I/Q crosstalk in the VNA used in the lab.

This analysis follows the methods presented in MIT Memo#333.

Crosstalk is seen to manifest in measurement as follows:

$T_{out} = \{re(T_{in}) + c * img(T_{in})\} + i \{im(T_{in}) + c * re(T_{in})\}$; Therefore it can be corrected by taking the negative of 'c'.

In this analysis the following three measurement sets were used:

1. Rcv01_2018_08
2. Rcv01_2019_10
3. Rcv01_2015_09

Three sets of plots are plotted for different values of c: 0 (no correction), $1e-4$ & $6e-4$.

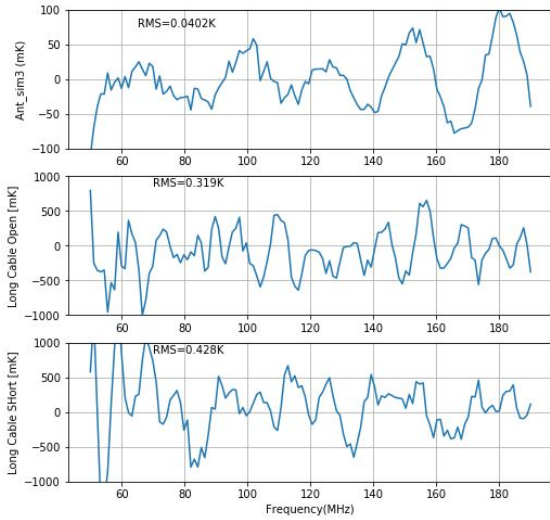
To analyse the crosstalk the residues of calibrated temperatures of: Antsim and longcables are looked at

Main Conclusions: No evidence of cross talk is observed:

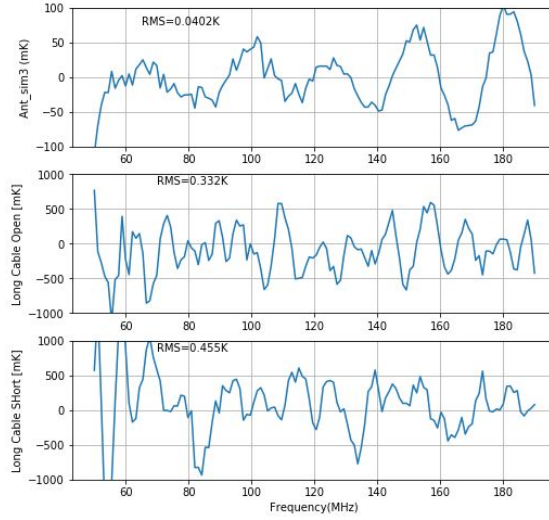
1. *Because on applying the correction, the ripples in the residues are seen to increase.*
2. *The induced ripple frequency is the same irrespective of the measurement set*
3. *Antsim3 residues doesn't change much with the correction*

Receiver01_2018_08

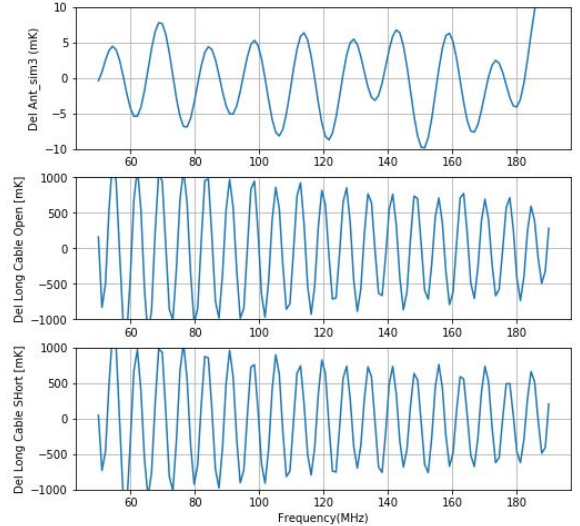
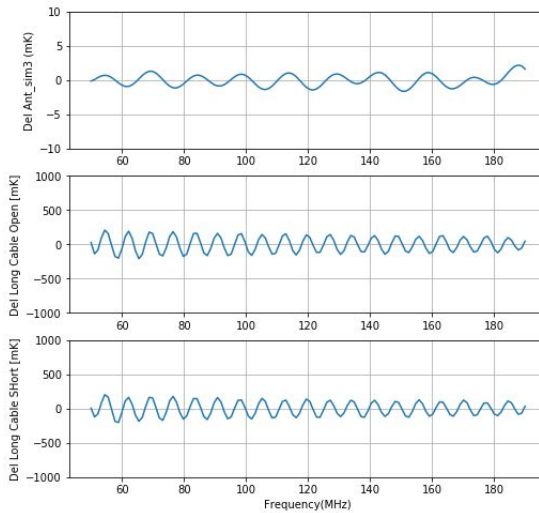
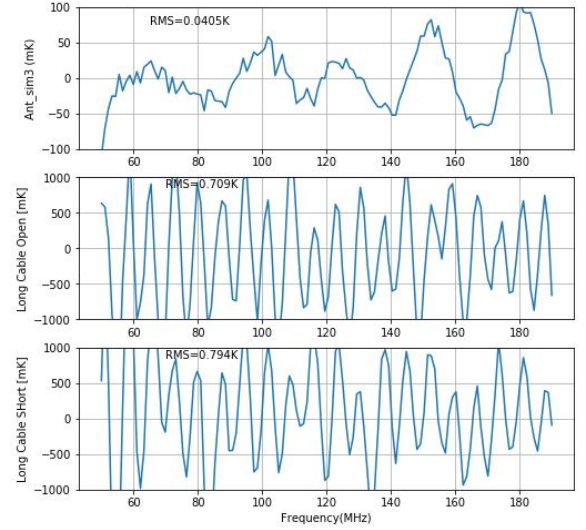
C = 0



C = -1e-4

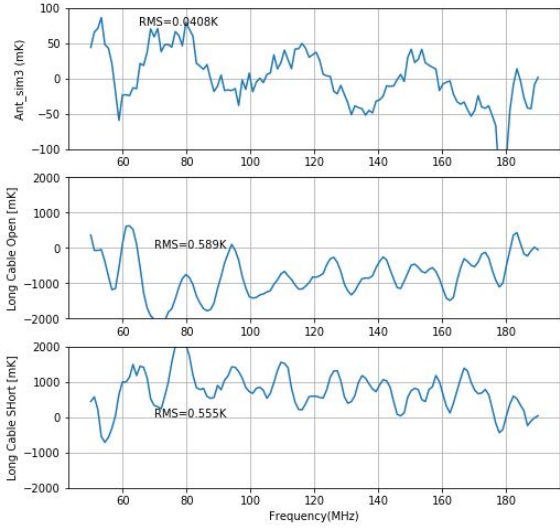


C = -6e-4

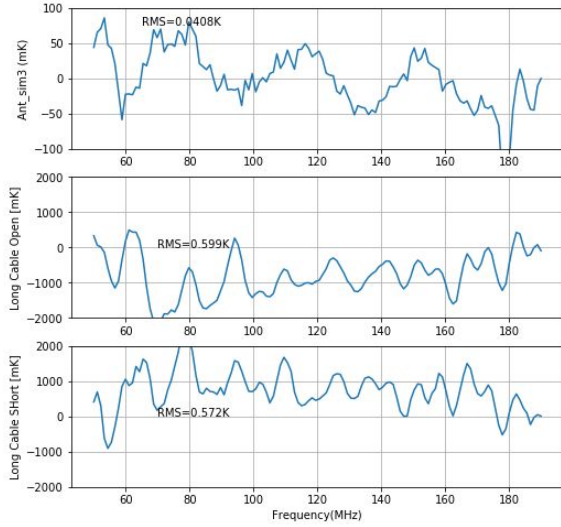


Receiver01_2019_10

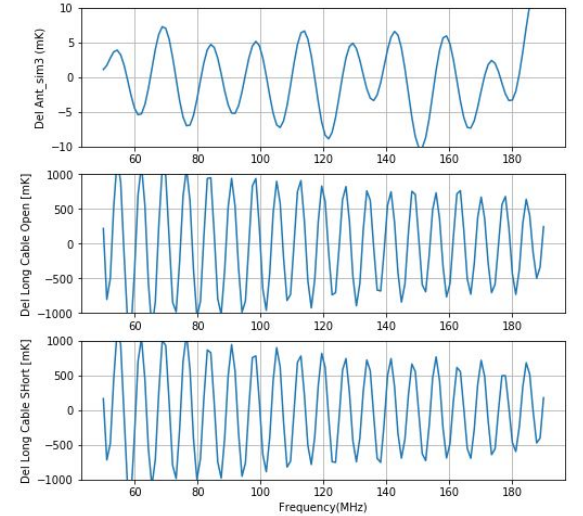
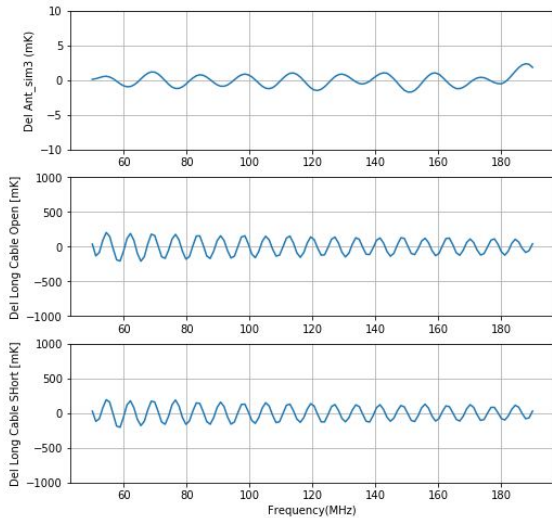
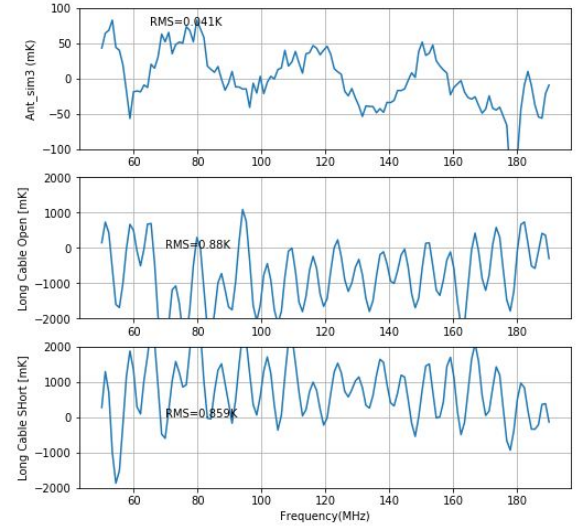
C = 0



C = -1e-4

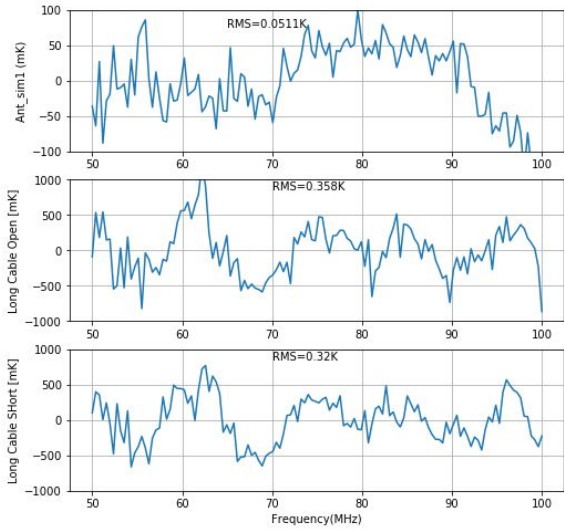


C = -6e-4

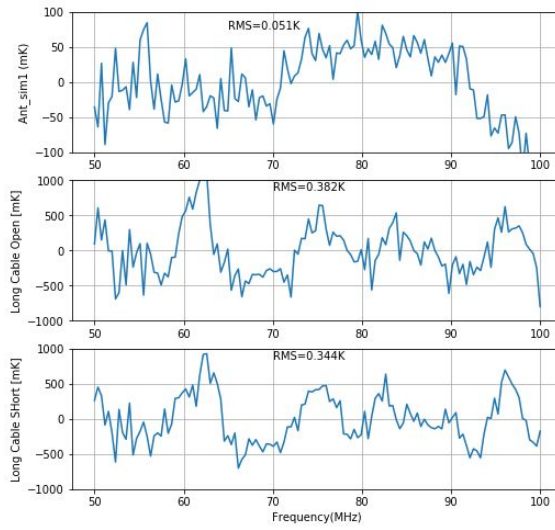


Receiver01_2015_09

$C = 0$



$C = -1e^{-4}$



$C = -6e^{-4}$

