

Modifications on the

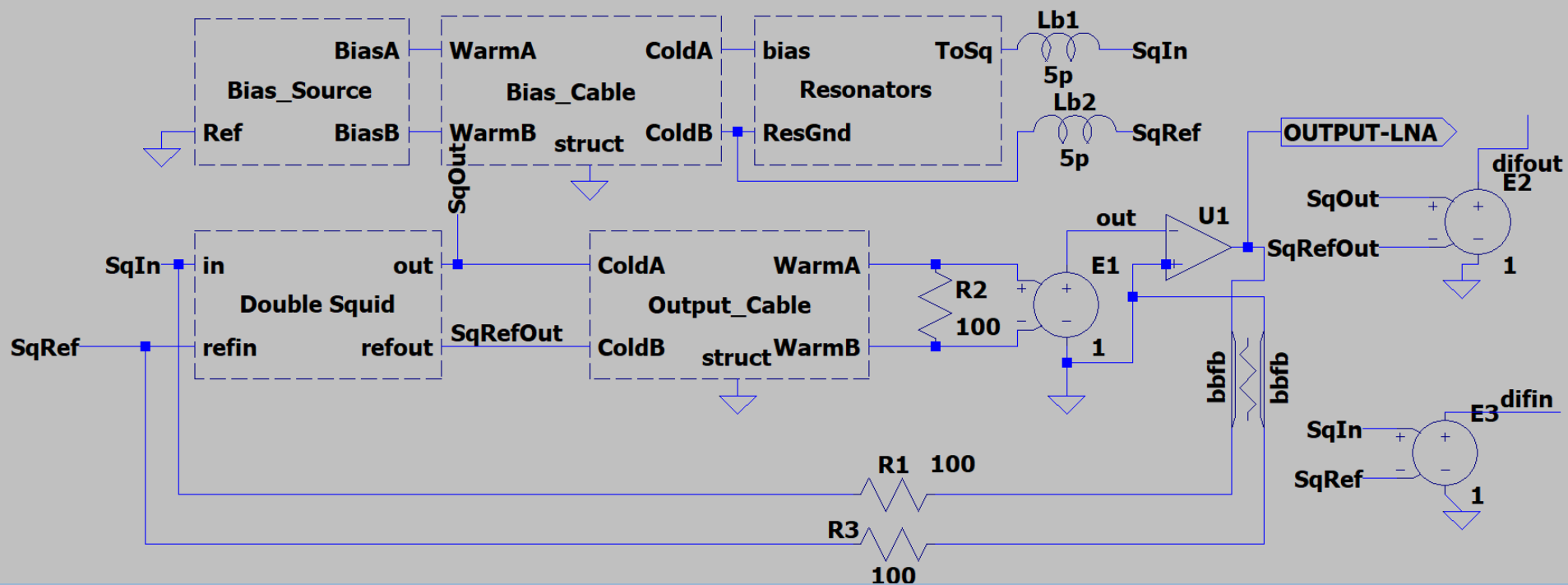
FDM Baseband Feedback Model OBR Measurement

I. Impact of cables at room temperature

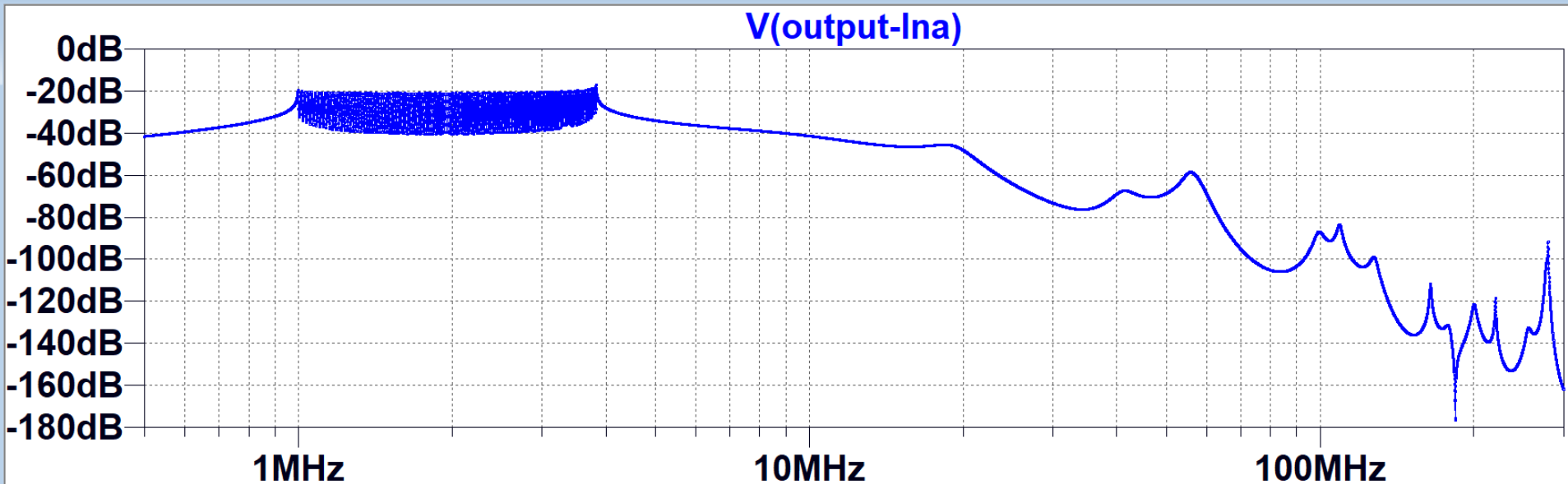


Amin Aminaei, 06 December 2021

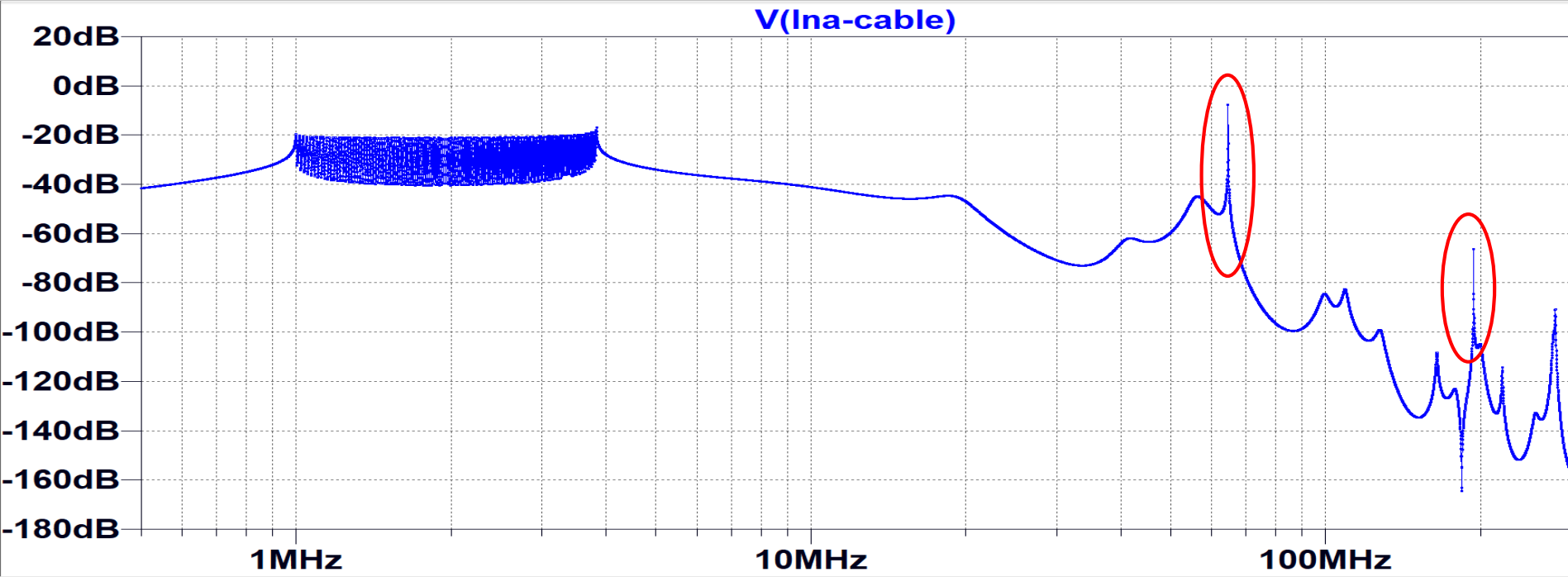
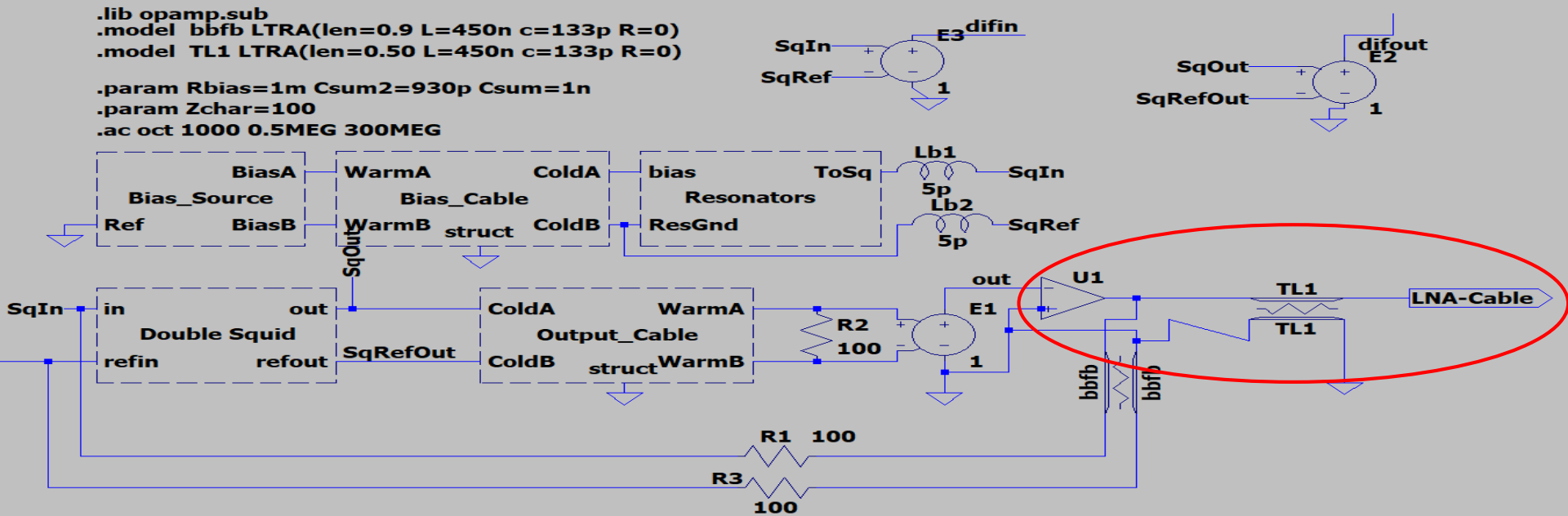
FDM Baseband Feedback Model-No Cable after LNA



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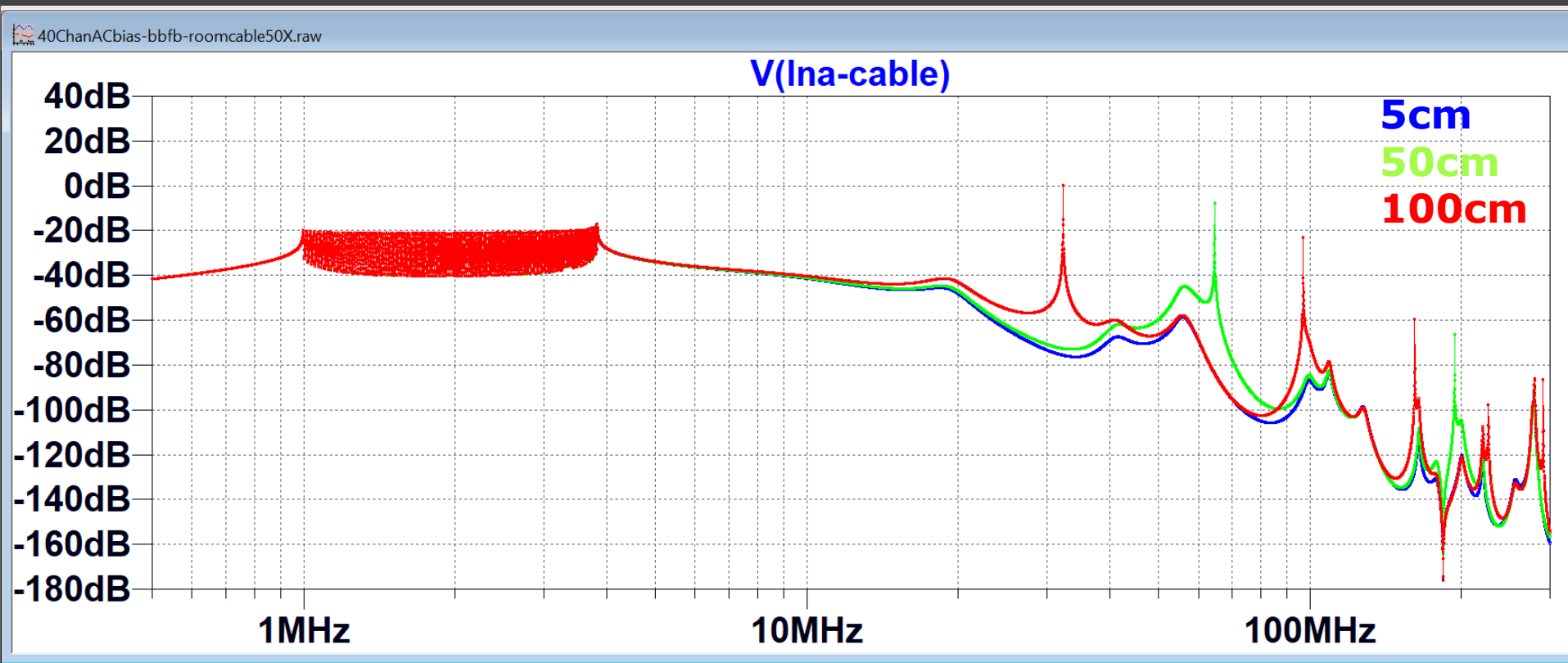


OBR Measurement- 50cm Cable after LNA



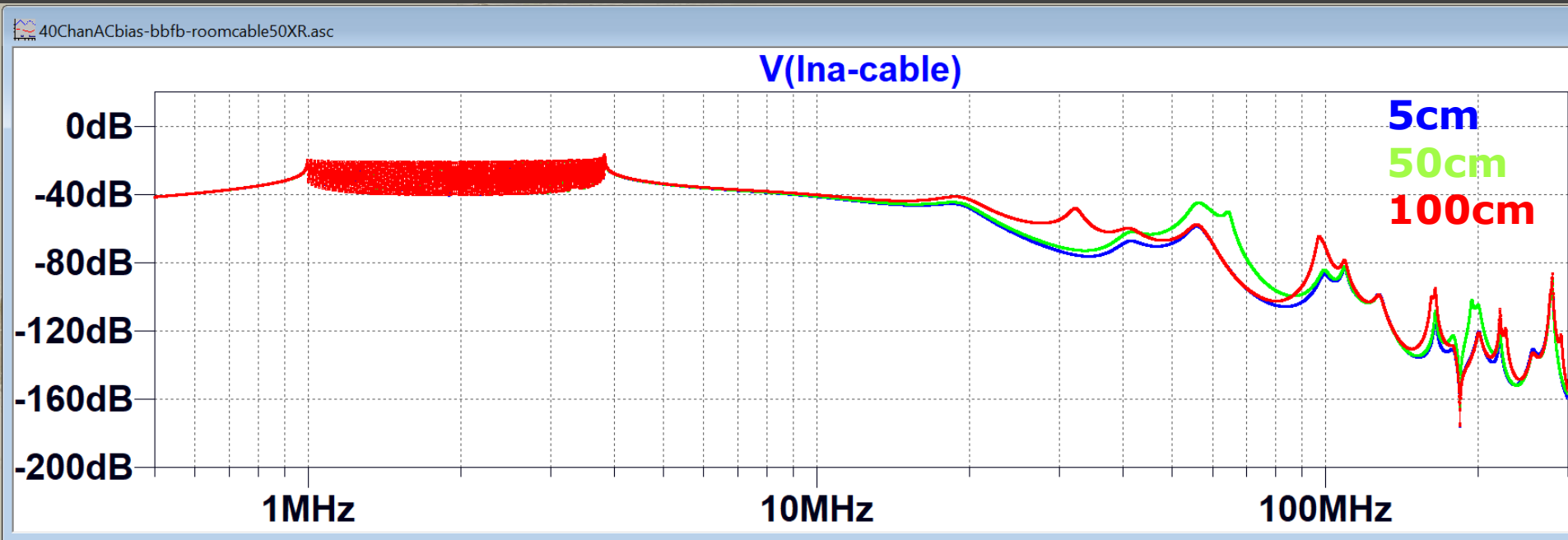
OBR Cable after LNA at room temperature

- Transmission line (Twisted pair, $L=450\text{n}$, $C=133\text{p}$, $R=0$)



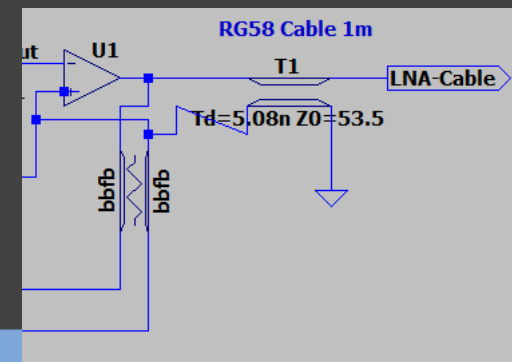
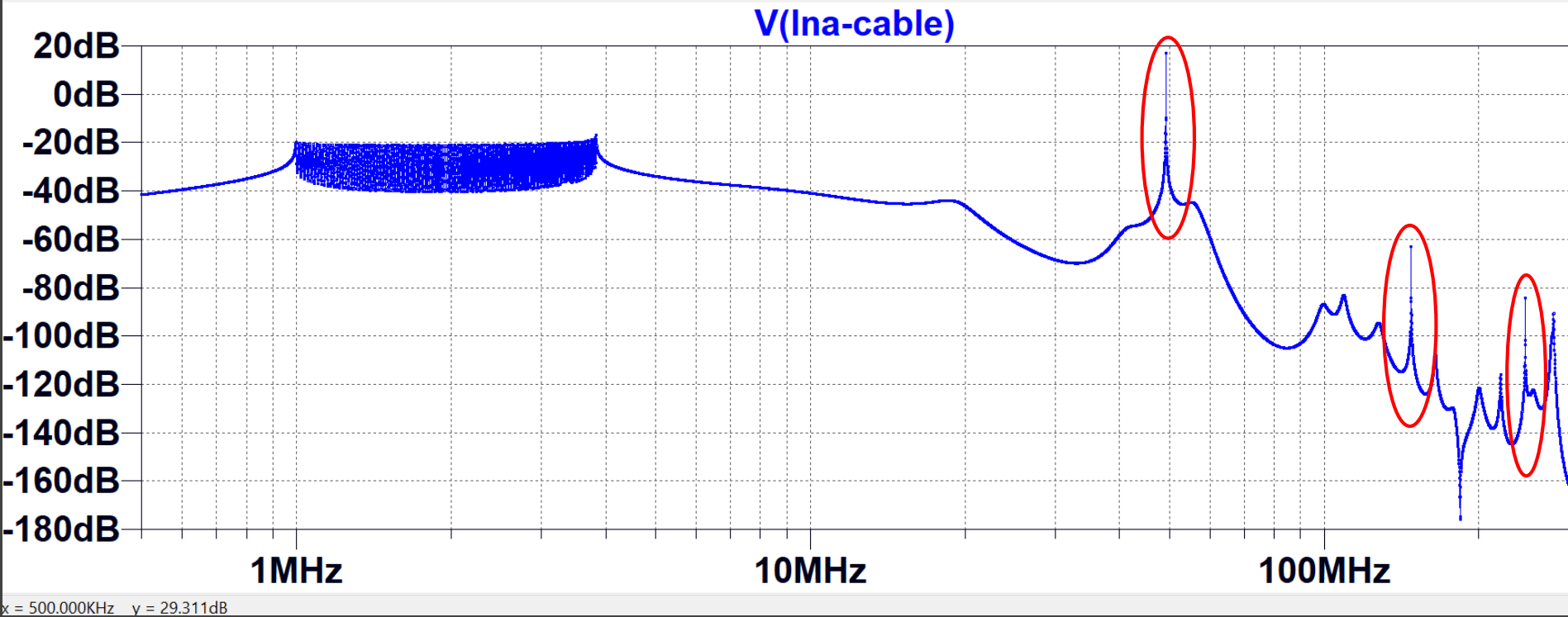
OBR Cable after LNA at room temperature

- Transmission line (Resistive Twisted pair, $L=450\text{n}$, $C=133\text{p}$ $R=5\text{ Ohm}$)



OBR Cable after LNA at room temperature

-Standard Cable RG58, $Z_0=53.5$, $T_d=5.08\text{ns}$, 1m



Conclusion

- Cables after the room temperature amplifier have a significant impact on the OBR
- The cables are modelled with lossy and lossless twisted pairs (transmission line), Standard cable of RG-58 (coaxial) is also simulated. In all cases additional OBR peaks observed which become repetitive as the length of cable increases.
- This should be considered for external LNA measurement for OBR in the lab
- This also represent the impact on OBR for the harness after preamplifier in the flight model

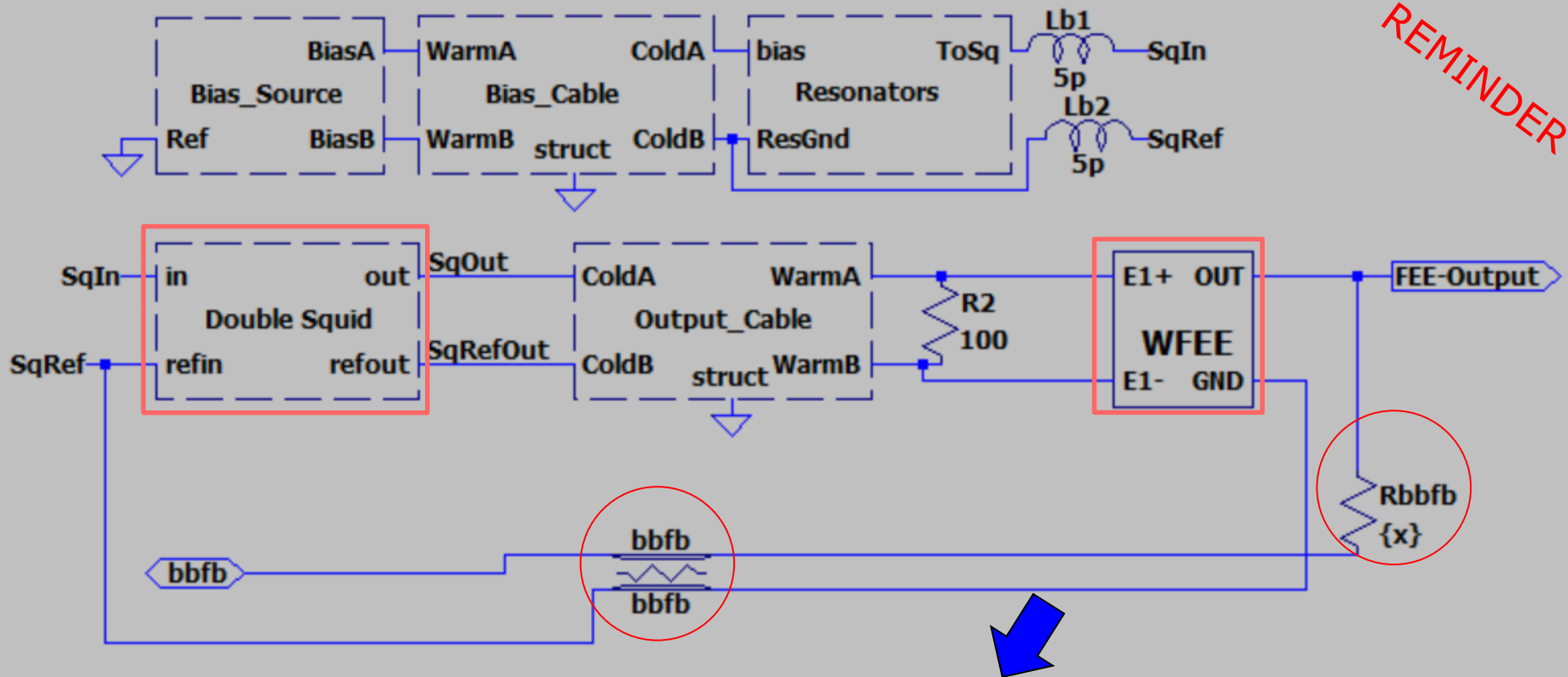
References:

<https://www.awcwire.com/rg-catalog/rg58-coax-cable>

<https://electronics.stackexchange.com/questions/589901/how-to-quantify-td-and-z0-for-a-given-length-of-rg-58-coax-cable-in-ltspice>

Backup Slides

REMINDER

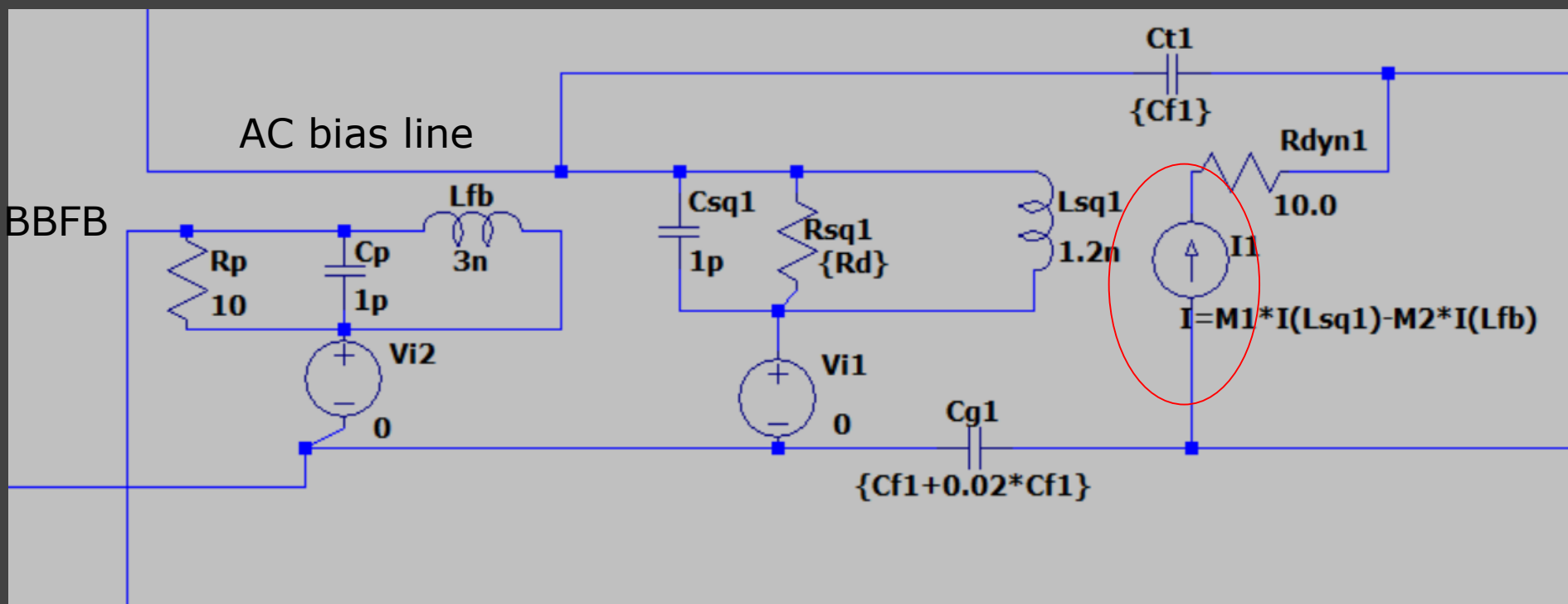
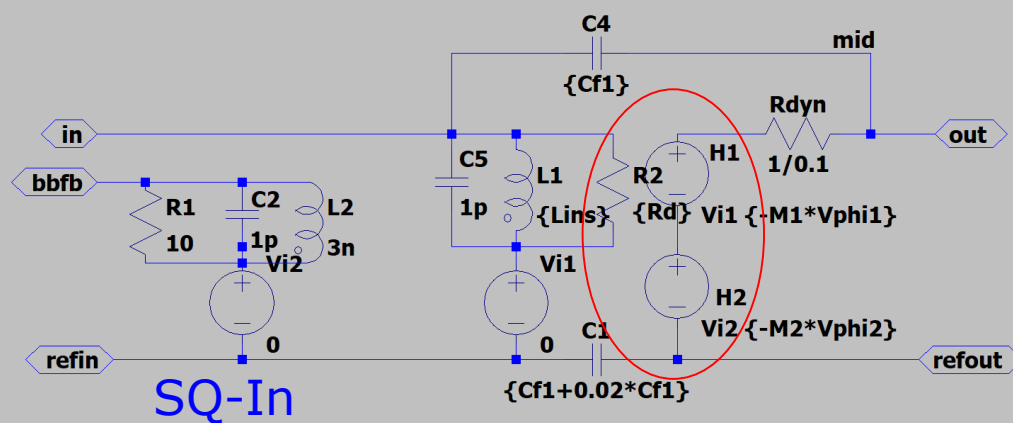


TwistedPair_{BBFB} : Length=90cm, L=450nH, C=133pF, Z0=58 Ohm

$R_{BBFB} = 1k, 10k$

In SQUID model, voltage sources are replaced with current sources which are dependent on the inductance currents.

REMINDER



The impact of BBFB twisted pair (90 cm) are dominant in the OBR features and adding snubber doesn't seem to improve it.

