

Time Domain Analysis of Cable Measurement Scaling

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Overview

- This presentation is a follow-up to “Limit Line Scaling” presented at the October 16, 2013 Channel Modeling ad hoc conference call:

http://www.ieee802.org/3/bq/public/channelmodeling/larsen_3bq_channel_model_ad_hoc_Oct-16-13_limit_line_scaling.pdf

- This presentation applies the scaling methodologies and shows the resulting time-domain channel responses.

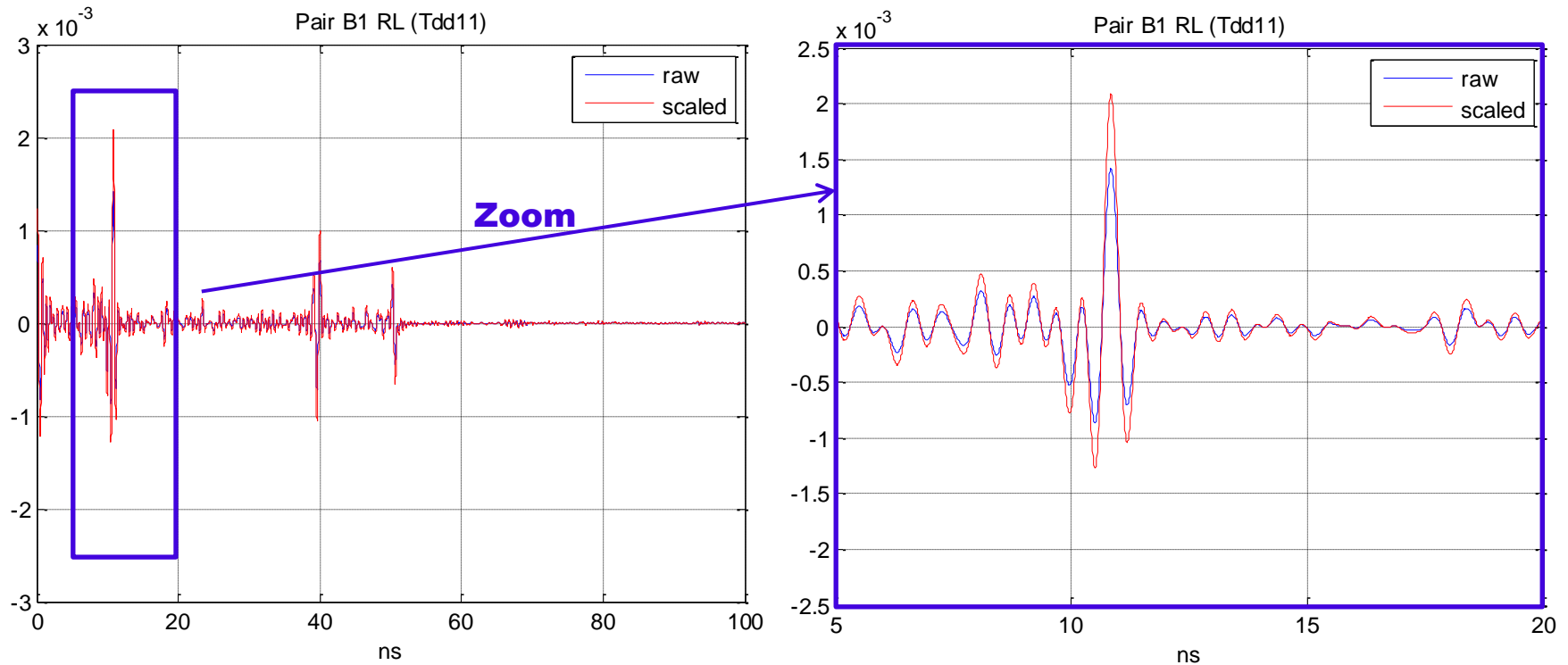
- The following cable measurements are used in the examples presented:

http://www.ieee802.org/3/bq/public/channeldata/wlarsen_long_channel_3-24-3.s16p.rar

http://www.ieee802.org/3/bq/public/channeldata/wlarsen_short_channel_1-3-1.s16p.rar

Time Domain Analysis

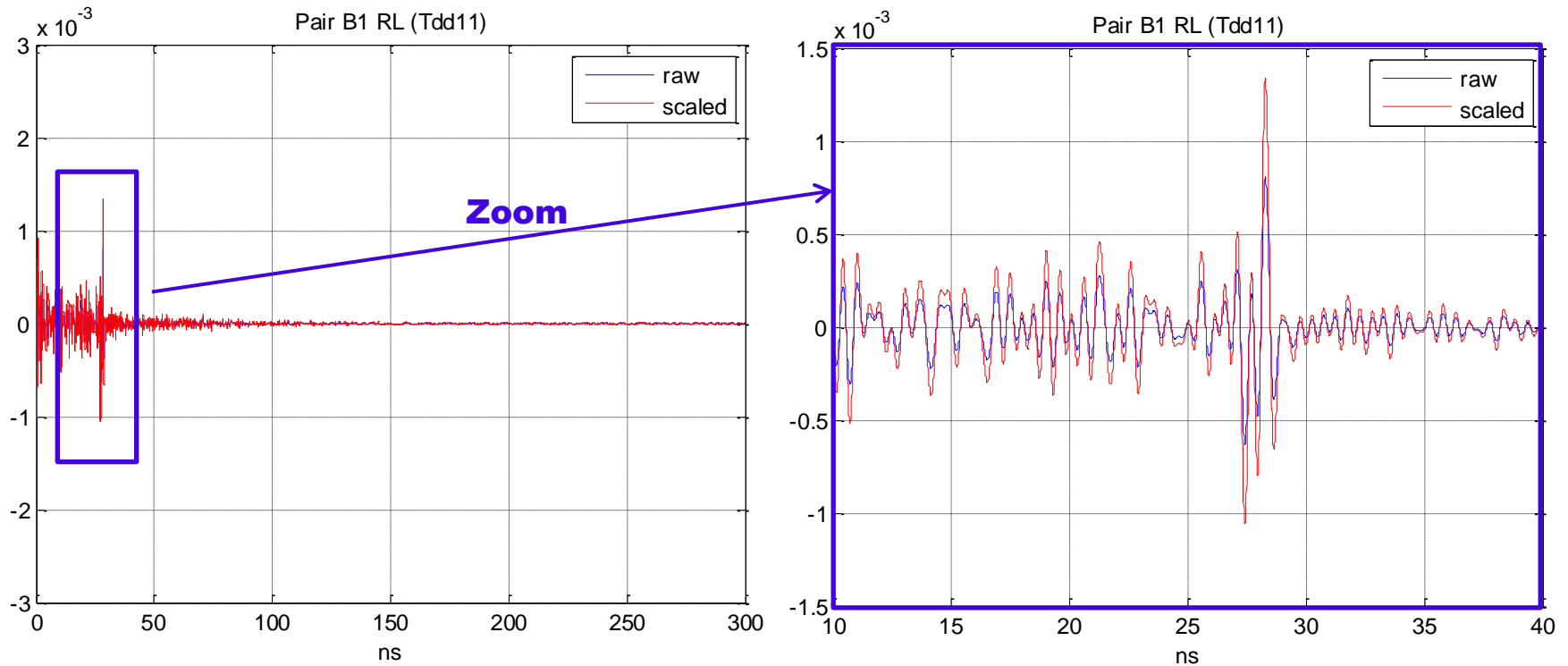
Return Loss Scaling of 1-3-1 Channel



**S16P: Larsen, "short channel 1-3-1.s16p", Pair B1 (Ports 3 and 4)
3.3 dB scale factor applied**

Time Domain Analysis

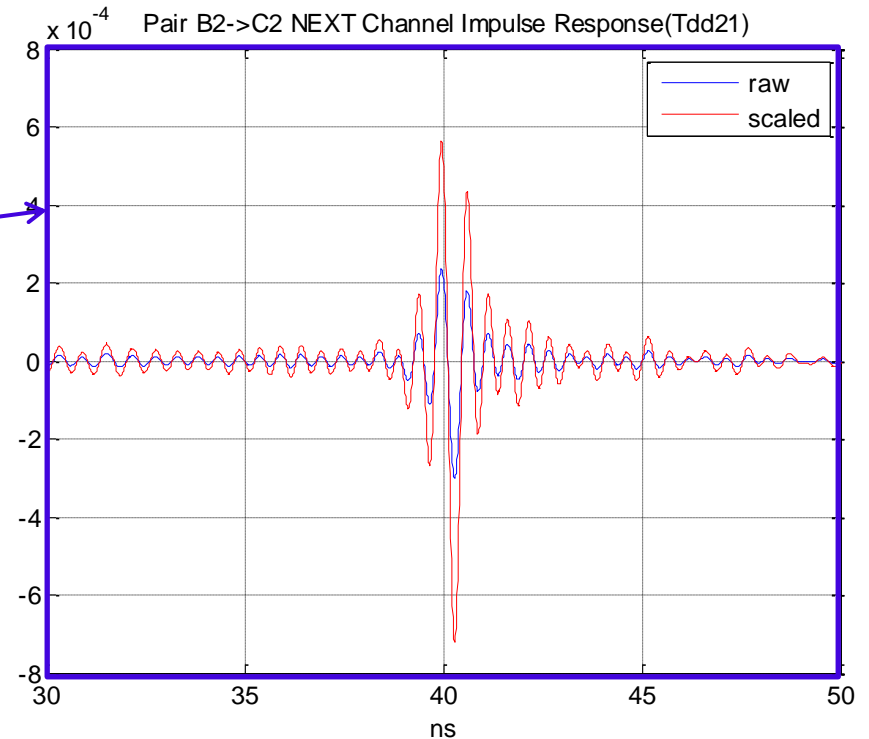
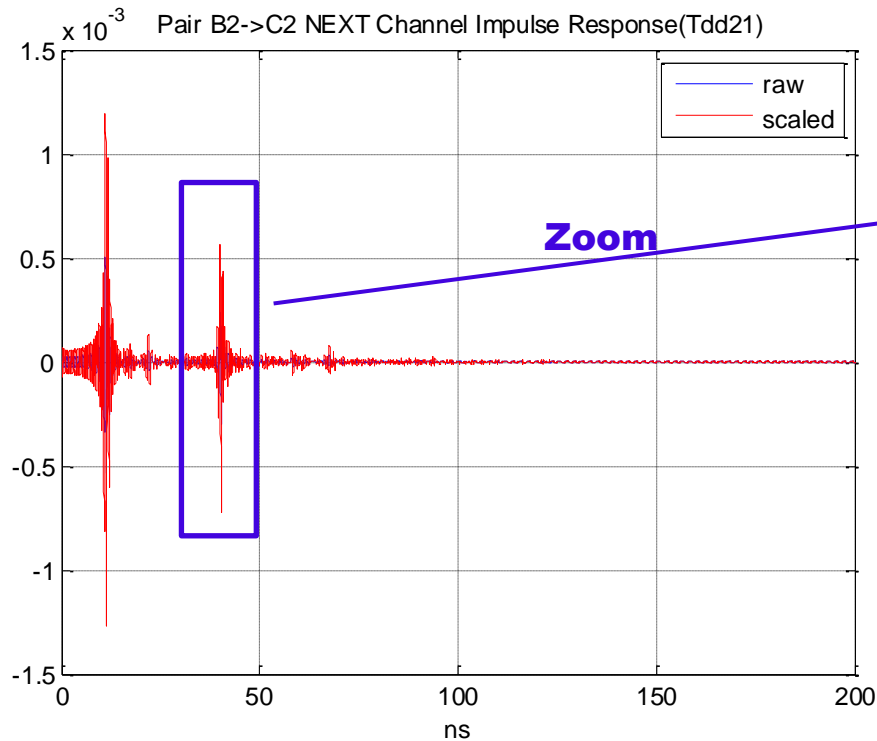
Return Loss Scaling of 3-24-3 Channel



S16P: Larsen, "long channel 3-24-3.s16p", Pair B1 (Ports 3 and 4)
4.4 dB scale factor applied

Time Domain Analysis

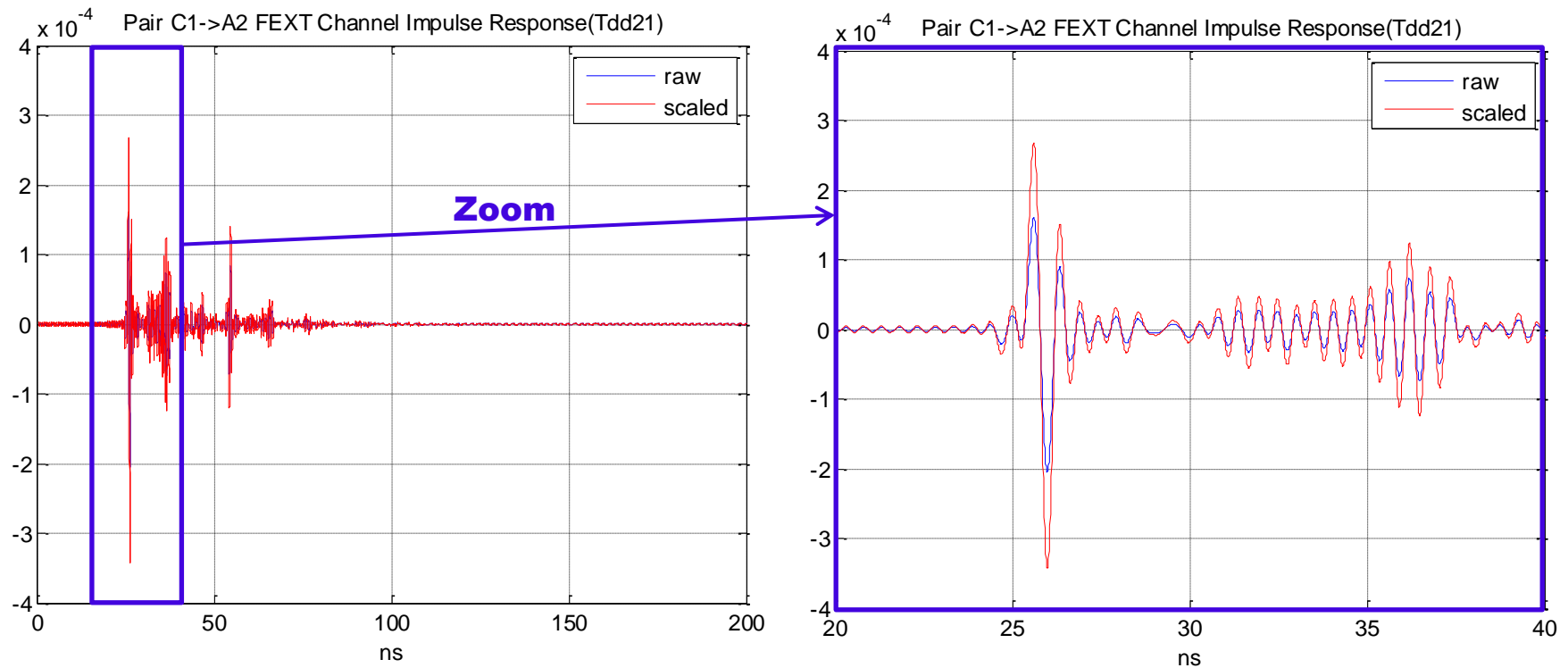
NEXT Scaling of 1-3-1 Channel



**S16P: Larsen, “short channel 1-3-1.s16p”, Pair B1 (Ports 3 and 4)
7.6 dB scale factor applied**

Time Domain Analysis

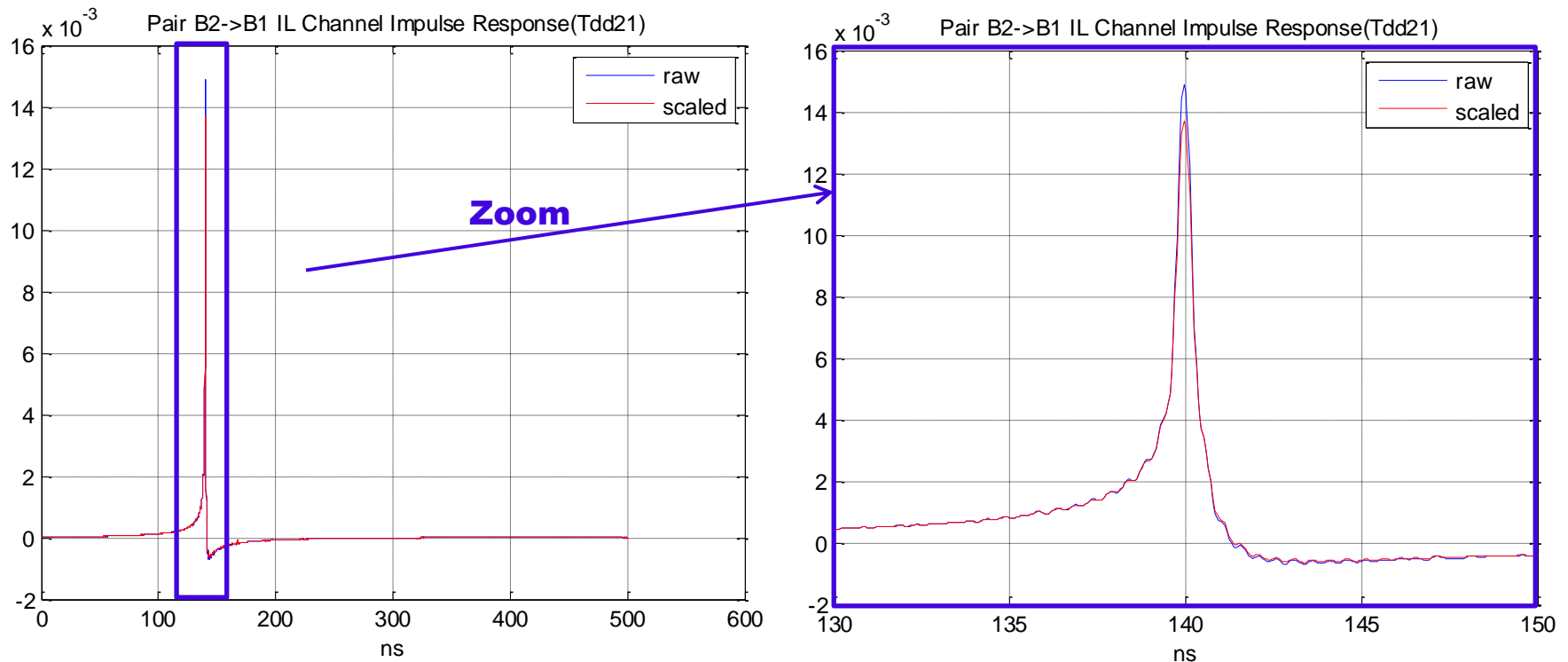
FEXT Scaling of 1-3-1 Channel



**S16P: Larsen, "short channel 1-3-1.s16p", Pair B1 (Ports 3 and 4)
4.5 dB scale factor applied**

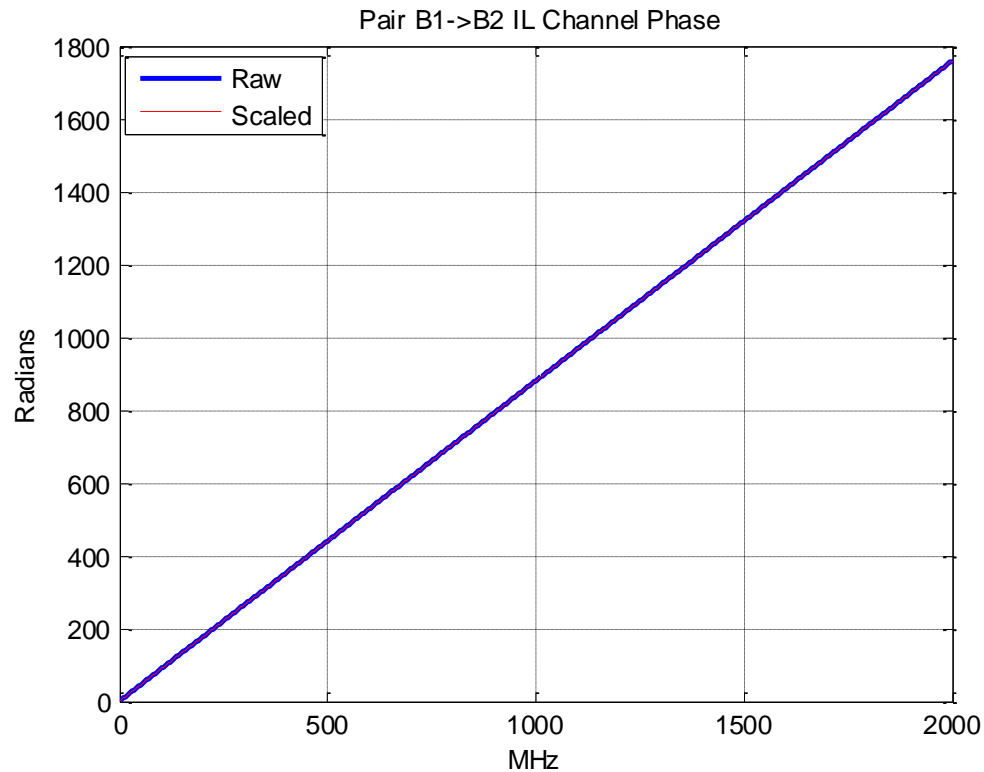
Time Domain Analysis

Insertion Loss Scaling of 3-24-3 Channel



S16P: Larsen, "long channel 3-24-3.s16p", Pair B2->B1
1.1 dB scale factor applied at minimum margin frequency with factor
scaled by \sqrt{f} .

Insertion Loss Channel Phase



S16P: Larsen, “long channel 3-24-3.s16p”, Pair B2->B1
1.1 dB scale factor applied at minimum margin frequency with factor
scaled by \sqrt{f} .

Conclusions and Next Steps

- The scaling approach applied to Return Loss, FEXT, NEXT, and IL does not change the channel phase response (beyond negligible numerical effects).
- Recommend supporting the scaling approaches outlined in “larsen_3bq_channel_model_ad_hoc_Oct-16-13_limit_line_scaling.pdf”

Thank you