802.3bj
Channel Evaluation with COM

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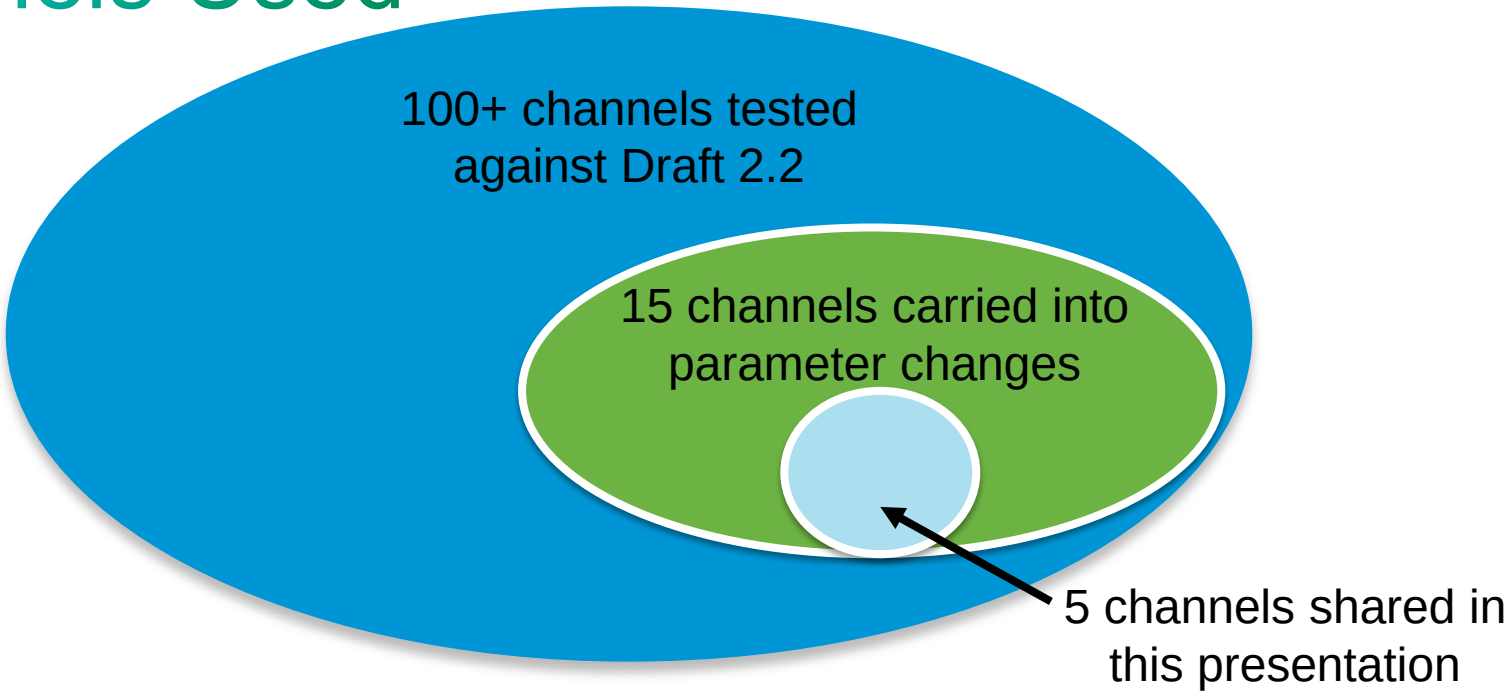
Outline

This presentation addresses Comment #125 to draft 2.2

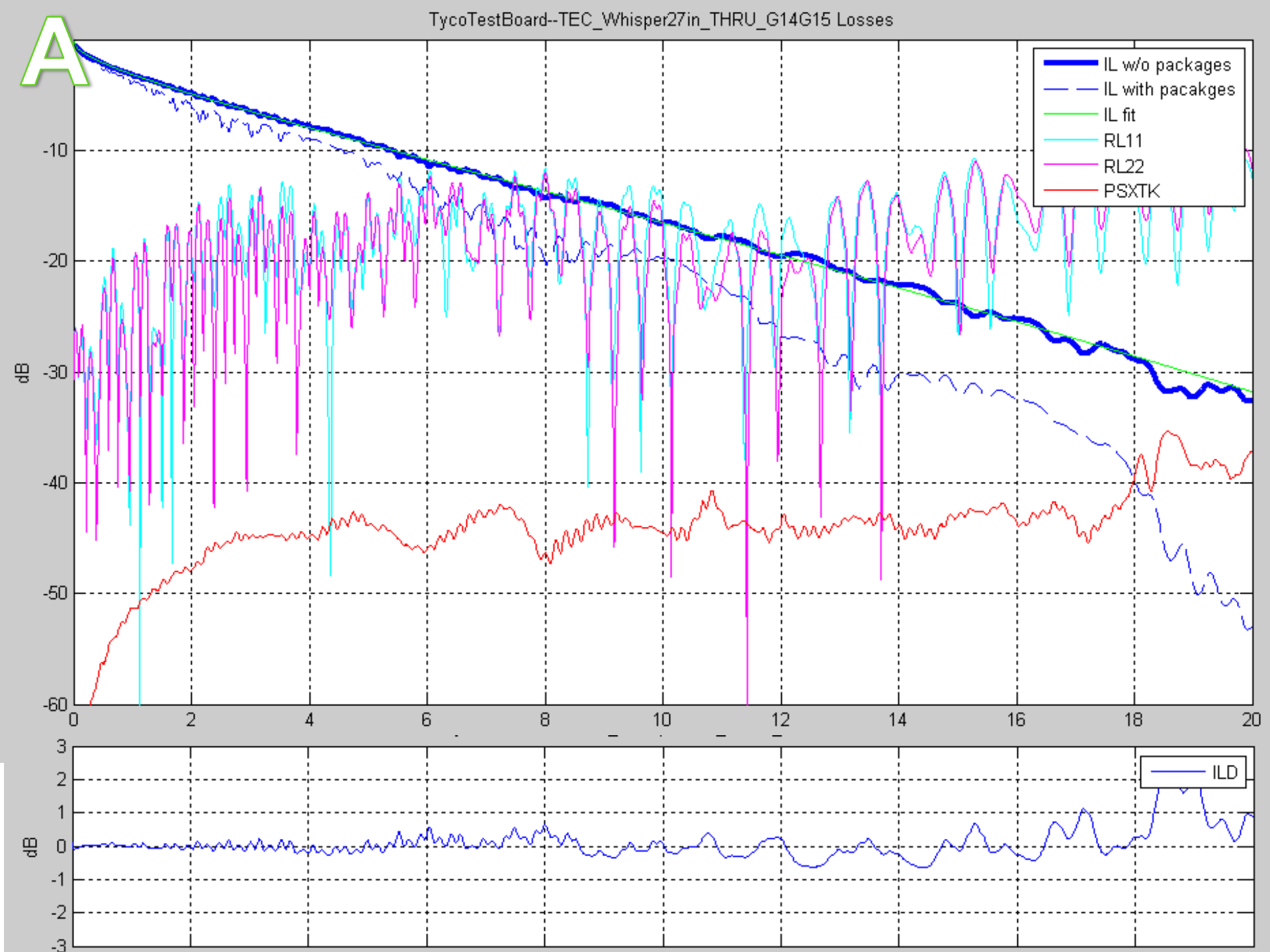
- Channels Used
- Exploration of Parameters Results
- Proposal Options

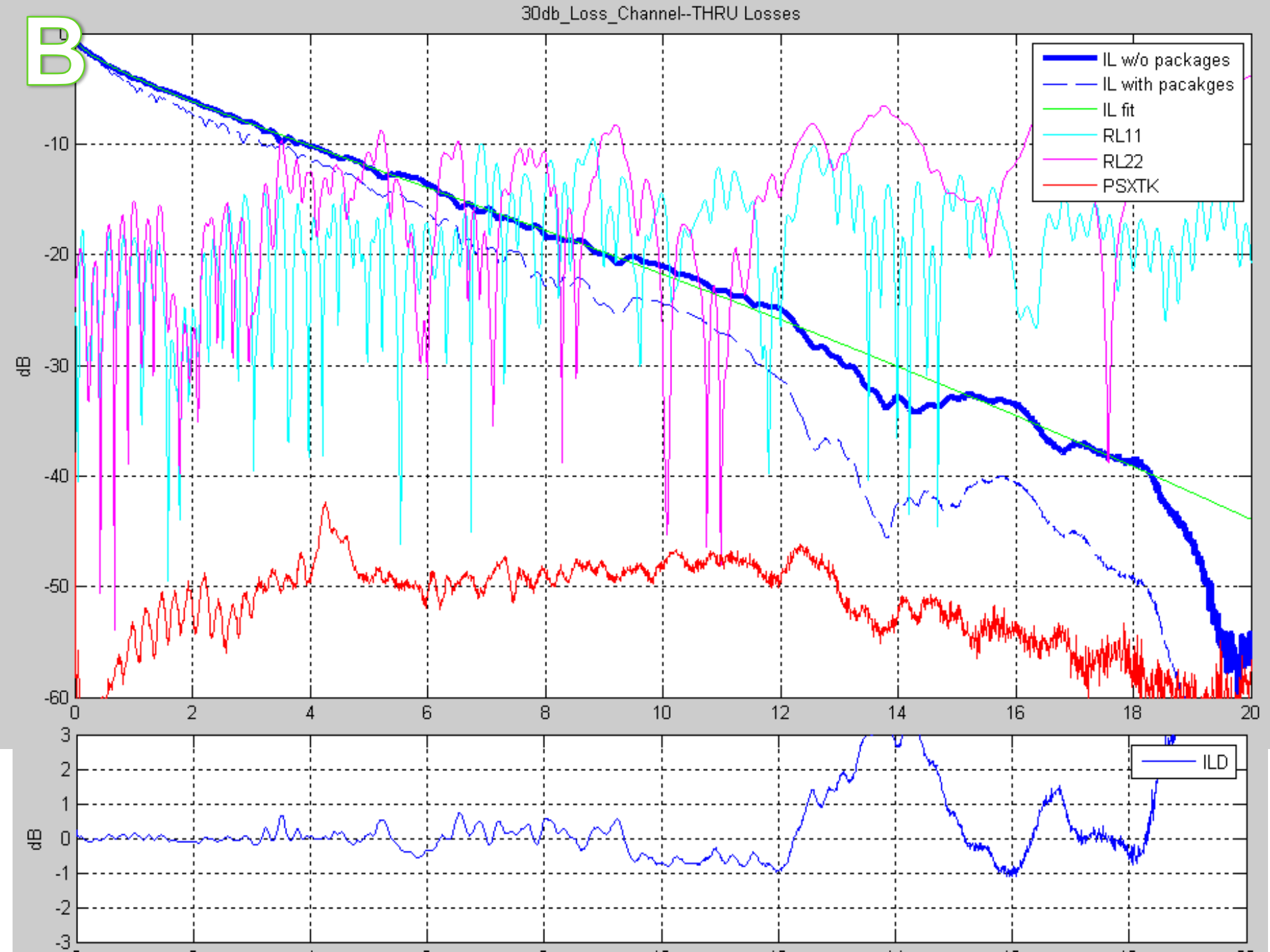
Channels Used



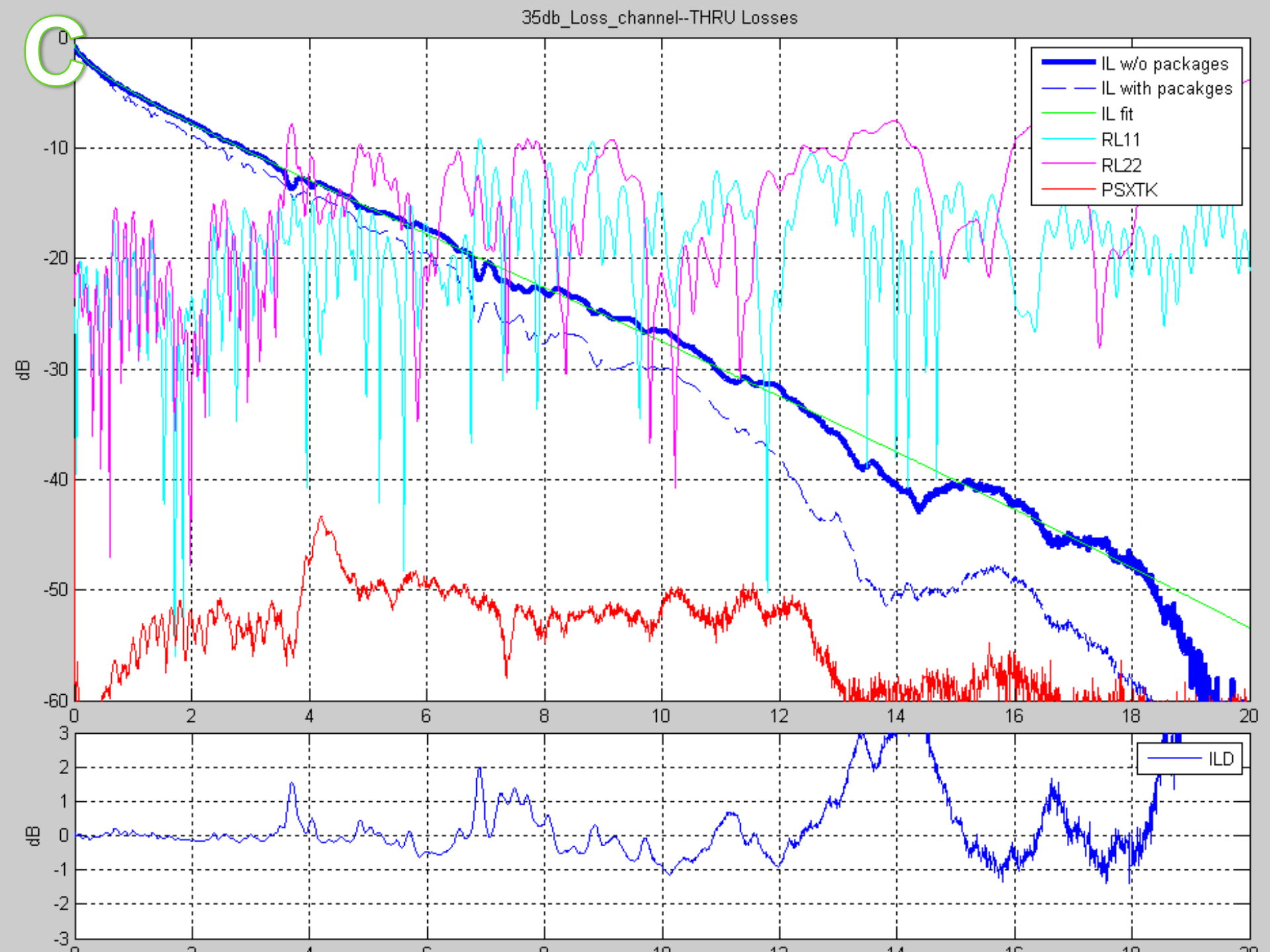
- 15 Channels for parameter change exploration
  - 3 channels from IEEE database
  - 9 additional channels (varying levels difficulty)
    - should be included in standard
  - 3 channels – beyond reasonable limits of standard
- 2 additional simulated channels supplied for IEEE database

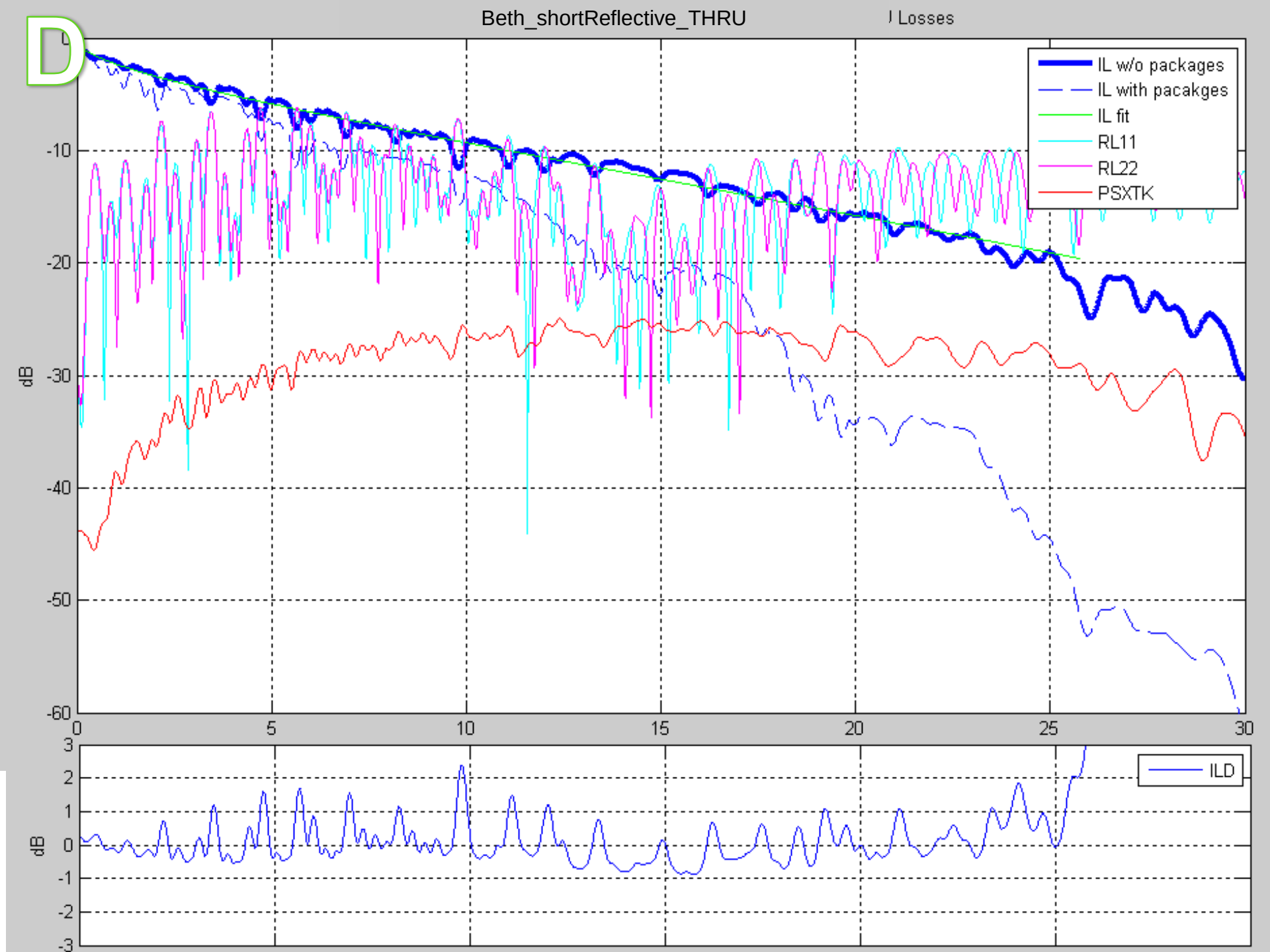
A

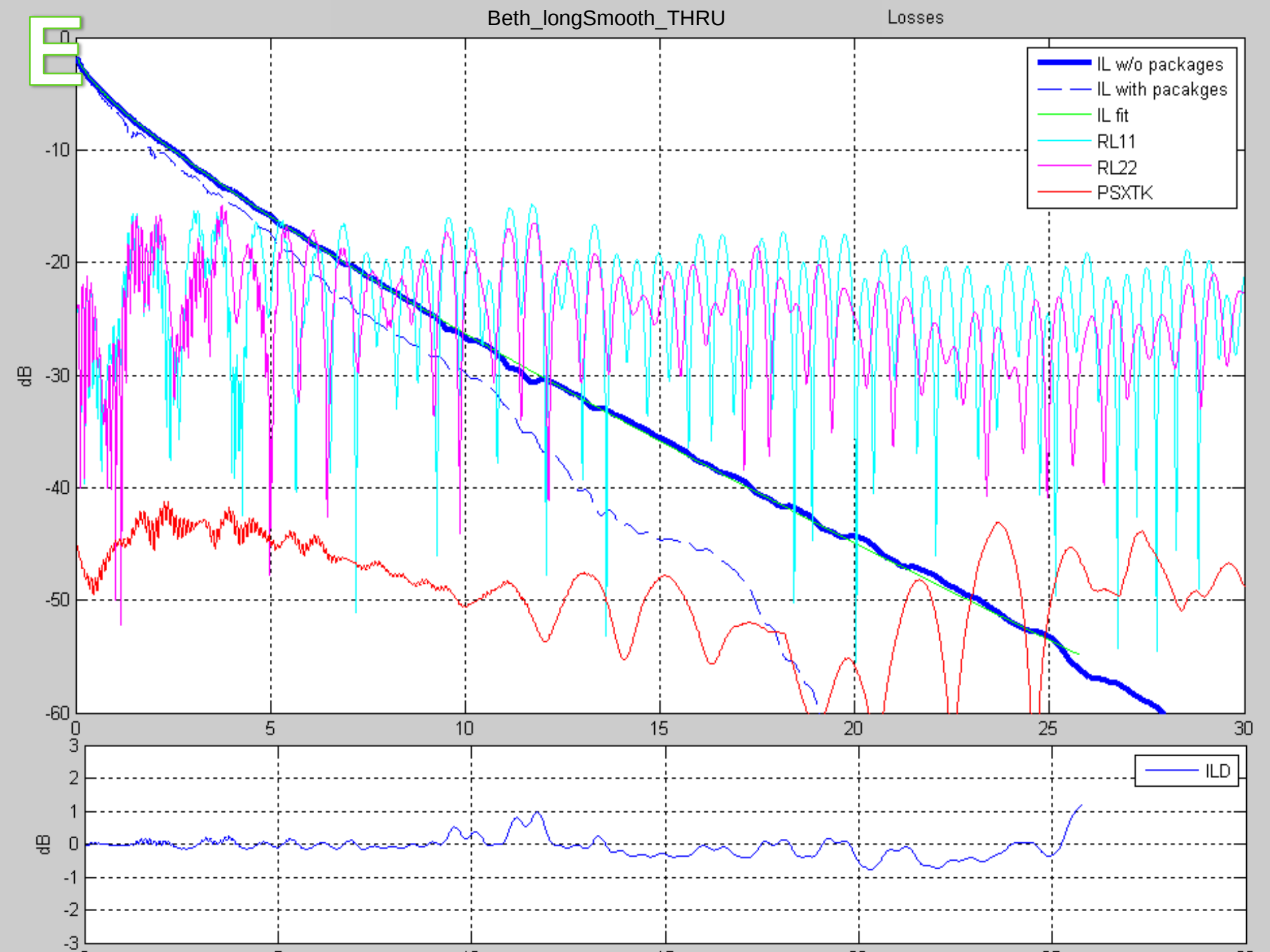

TycoTestBoard--TEC_Whisper27in_THRU_G14G15 Losses
IL w/o packages
IL with pacakges
IL fit
RL11
RL22
PSXTK
dB
-10
-20
-30
-40
-50
-60
0
2
4
6
8
10
12
14
16
18
20
ILD
dB
3
2
1
0
-1
-2
-3


B
30db_Loss_Channel--THRU Losses
IL w/o packages
IL with pacakges
IL fit
RL11
RL22
PSXTK
dB
-10
-20
-30
-40
-50
-60
0
2
4
6
8
10
12
14
16
18
20
ILD
dB
3
2
1
0
-1
-2
-3

C


35db_Loss_channel--THRU Losses
IL w/o packages
IL with pacakges
IL fit
RL11
RL22
PSXTK
dB
0
-10
-20
-30
-40
-50
-60
0
2
4
6
8
10
12
14
16
18
20
ILD
dB
3
2
1
0
-1
-2
-3


D
Beth_shortReflective_THRU
Losses
IL w/o packages
IL with pacakges
IL fit
RL11
RL22
PSXTK
dB
-10
-20
-30
-40
-50
-60
0
5
10
15
20
25
30
ILD
dB
3
2
1
0
-1
-2
-3


Beth_longSmooth_THRU
Losses
IL w/o packages
IL with pacakges
IL fit
RL11
RL22
PSXTK
dB
0
-10
-20
-30
-40
-50
-60
0
5
10
15
20
25
30
ILD
dB
3
2
1
0
-1
-2
-3

D2.2 Evaluation

Channel #	Description	12mm pkg	30mm pkg	COM – d2.2
A	Tyco, ~20dB	6.5869	6.5011	6.5011
B	IBM, ~30dB	6.351	7.0011	6.351
C	IBM, ~35dB	4.5389	5.8316	4.5389
D	Beth, ~11dB	3.5858	3.6888	3.5858
E	Beth, ~32dB	3.1853	2.1693	2.1693

- Majority of channels expected to pass passed;
  - 12 of exploration channels taken from this group – including 2 failing cases
  - D & E were selected as good representation of data included in exploration
    - If D&E passed, all other exploration channels (intended to pass) passed
- COM is close, but channel E should be included

Explore Package

Chan	12mm	16mm	20mm	23mm	26mm	30mm
A	6.5869	6.6338	6.7719	6.6698	6.6442	6.5011
B	6.351	6.5303	6.3661	6.5358	6.4457	7.0011
C	4.5389	4.642	4.7464	5.5803	5.9514	5.8316
D	3.5858	3.7592	3.7093	3.9913	3.9537	3.6888
E	3.1853	2.9626	2.8172	2.6507	2.4181	2.1693

- A single package model should be used for COM. Select a REFERENCE to use and let TX/RX design account for differentiation from reference.
- Effects of 12mm and 30mm were not consistent as presenters stated in July. Statement was that 12mm would limit the reflective channels, 30mm would limit the long channels… over the sweep of channels, this was not found to be always true.

  Take IBM 35dB & Beth_short channels (chan C&D) for example.

Explore SNR

- Comments 124 & 64 address SNR… wanted to explore impact of SNR change

Chan	SNR22	SNR26	d2.2 (SNR29)	SNR33	SNR36	SNR39
A	4.904	6.0293	6.5011	6.8137	6.9232	6.9828
B	4.7796	6.4684	6.351	6.6584	6.769	6.8206
C	3.4397	5.4167	4.5389	4.7314	4.8066	4.8369
D	2.6235	3.4132	3.5858	3.7599	3.8187	3.8493
E	1.4116	1.9708	2.1693	2.3041	2.3495	2.3723

Explore A_{DD}

A_{DD} 0.047	12mm	16mm	20mm	23mm	26mm	30mm	ORIGINAL 12mm	ORIGINAL 30mm
A	6.709	6.7573	6.9196	6.7948	6.7749	6.6231	6.5869	6.5011
B	6.4992	6.6793	6.5203	6.6895	6.6078	7.1729	6.351	7.0011
C	4.6717	4.7614	4.8673	5.747	6.1255	5.9514	4.5389	5.8316
D	3.664	3.8441	3.794	4.0825	4.046	3.7688	3.5858	3.6888
E	3.2989	3.0609	2.926	2.7574	2.5104	2.2702	3.1853	2.1693

A_{DD} 0.044	12mm	16mm	20mm	23mm	26mm	30mm	ORIGINAL 12mm	ORIGINAL 30mm
A	6.8328	6.8825	7.0531	6.8691	6.9002	6.7552	6.5869	6.5011
B	6.718	6.9569	6.7736	6.8582	6.7474	7.3481	6.351	7.0011
C	4.8218	4.913	5.0207	5.8998	6.2494	6.1079	4.5389	5.8316
D	3.7448	3.9256	3.8794	4.1692	4.1303	3.8495	3.5858	3.6888
E	3.4011	3.1728	3.0116	2.8534	2.5569	2.3723	3.1853	2.1693

Explore σ_{RJ} & A_{DD}

σ_{RJ} 0.0090	12mm	16mm	20mm	23mm	26mm	30mm	ORIGINAL 12mm	ORIGINAL 30mm
A	6.6021	6.645	6.7839	6.6829	6.6586	6.5091	6.5869	6.5011
B	6.3673	6.5409	6.3897	6.5593	6.4704	7.0273	6.351	7.0011
C	4.5536	4.6569	4.7614	5.5968	5.9686	5.8486	4.5389	5.8316
D	3.5932	3.7675	3.7187	4.002	3.9626	3.6971	3.5858	3.6888
E	3.1979	2.9748	2.8293	2.6624	2.4296	2.1804	3.1853	2.1693

A_{DD} 0.047 σ_{RJ} 0.0095	12mm	16mm	20mm	23mm	26mm	30mm	ORIGINAL 12mm	ORIGINAL 30mm
A	6.7141	6.7629	6.9259	6.8014	6.7822	6.6313	6.5869	6.5011
B	6.5158	6.6901	6.6221	6.7015	6.6204	7.1862	6.351	7.0011
C	4.6717	4.7765	4.8825	5.747	6.1255	5.9686	4.5389	5.8316
D	3.6678	3.8482	3.7987	4.0879	4.049	3.7743	3.5858	3.6888
E	3.2989	3.0733	2.926	2.7574	2.5104	2.2702	3.1853	2.1693

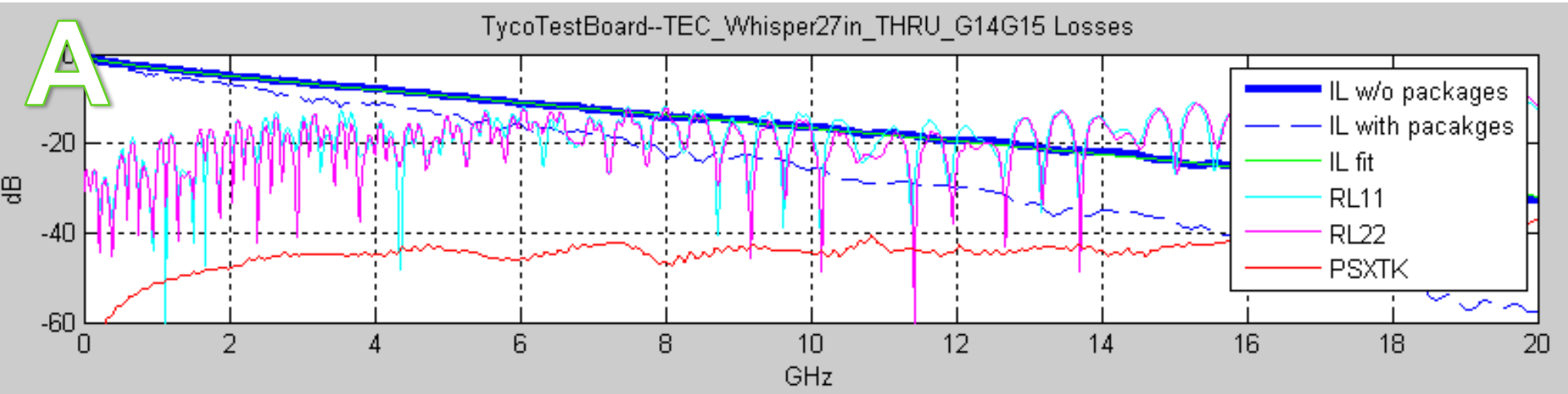
Proposal Options COM parameters

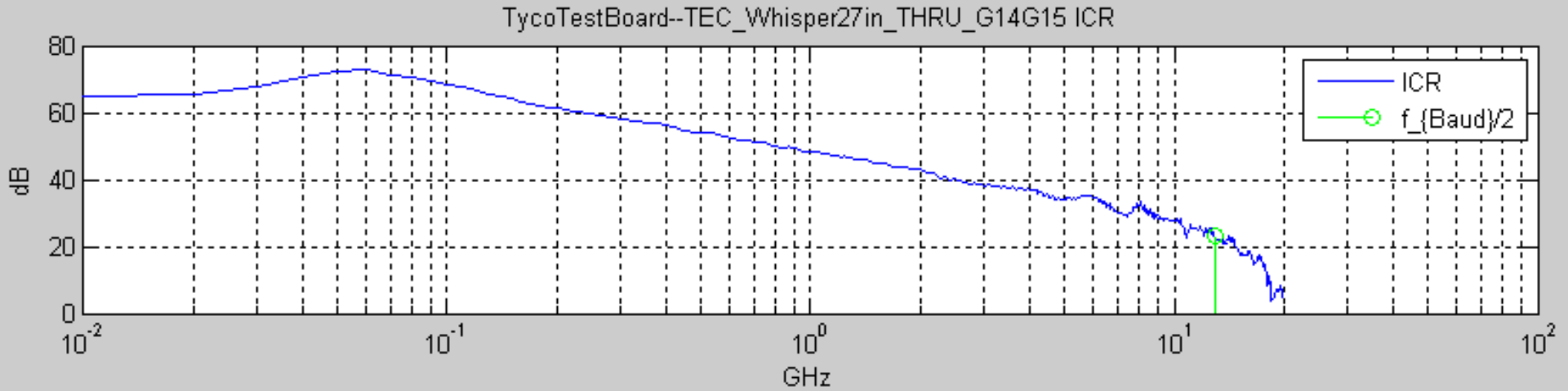
- Remove 30mm package
  - Channels that should have failed, still failed w/12mm pkg!
  - Statements upon reasoning of having 2 reference packages didn't hold through study.
  - Would allow for SNR to change to 26
- Change long package from 30mm to 23mm, SNR from 29 to 30, A_{DD} from 0.05 to 0.04
- According to comment #64, TX parameters would have to change accordingly
- Change long package from 30mm to 20mm & A_{DD} from 0.05 to 0.044
- Go to 12mm package only, SNR from 29 to 26, A_{DD} from 0.05 to 0.047, σ_{RJ} from 0.01 to 0.095

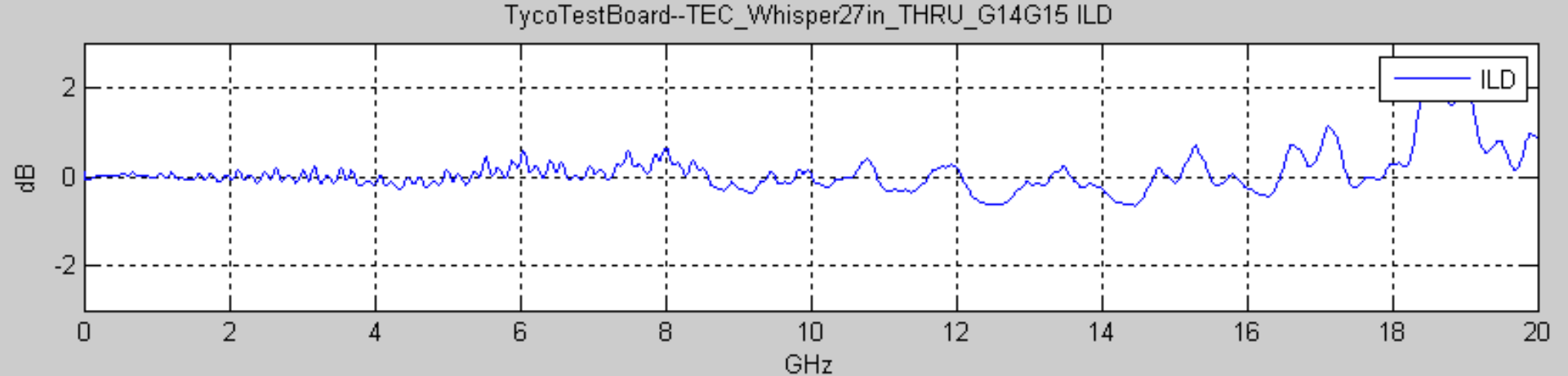
Thank you.

Backup

A


TycoTestBoard--TEC_Whisper27in_THRU_G14G15 Losses
IL w/o packages
IL with pacakges
IL fit
RL11
RL22
PSXTK
dB
GHz


TycoTestBoard--TEC_Whisper27in_THRU_G14G15 ICR
ICR
f_{Baud}/2
dB
GHz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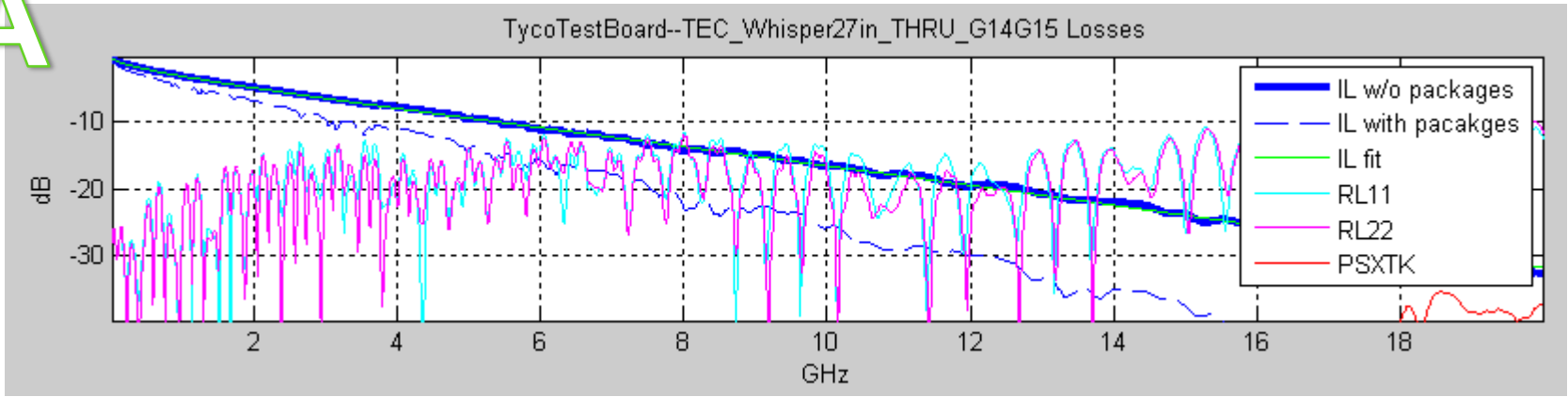
ILD
dB
GHz

A



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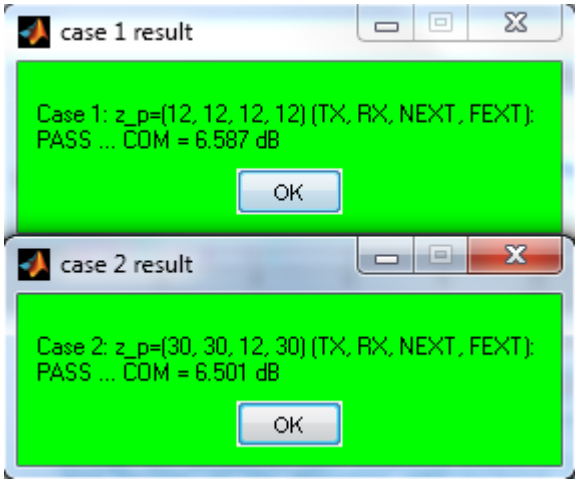
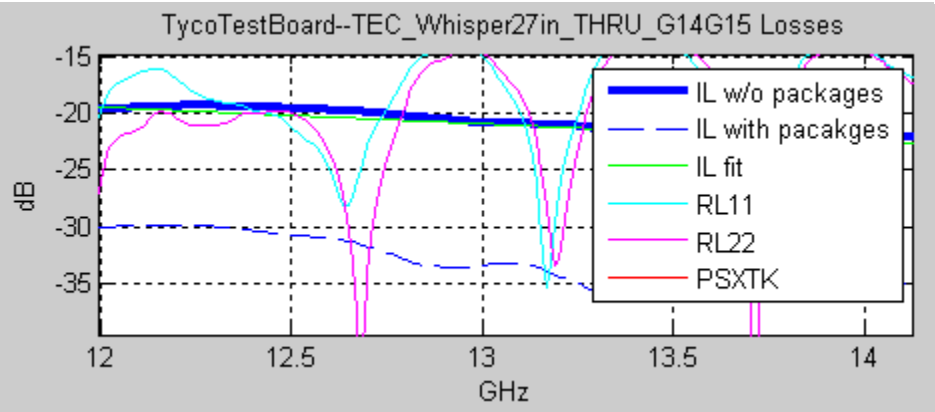
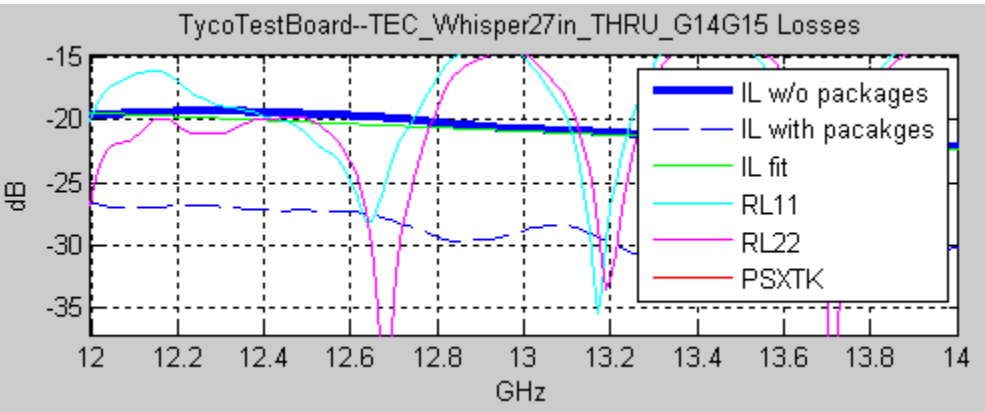
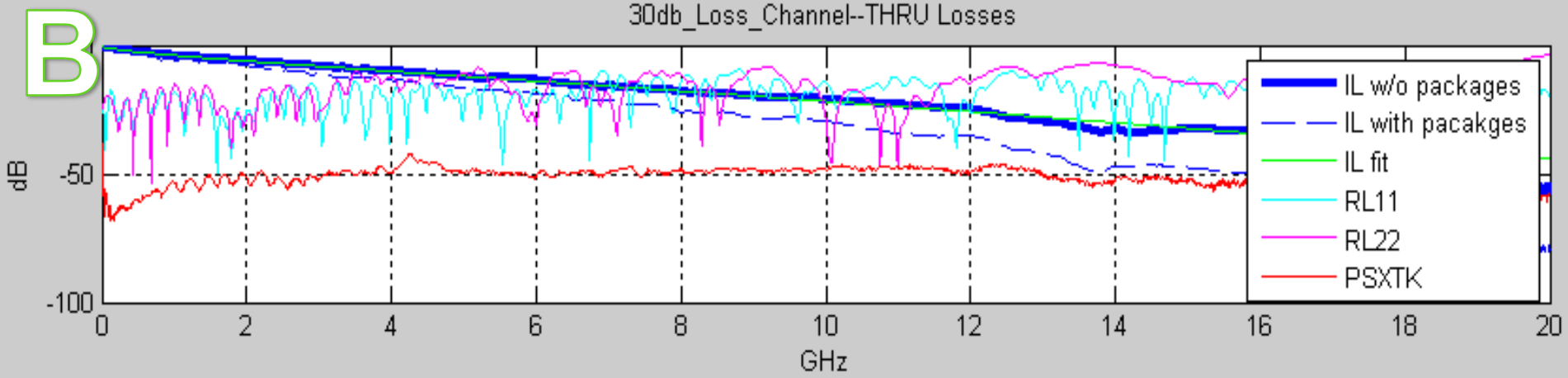
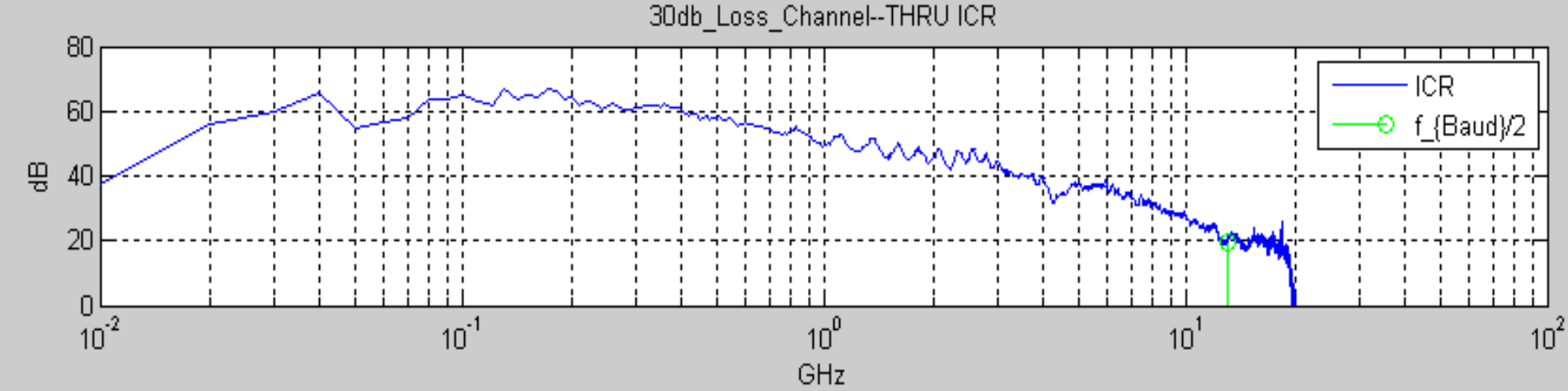


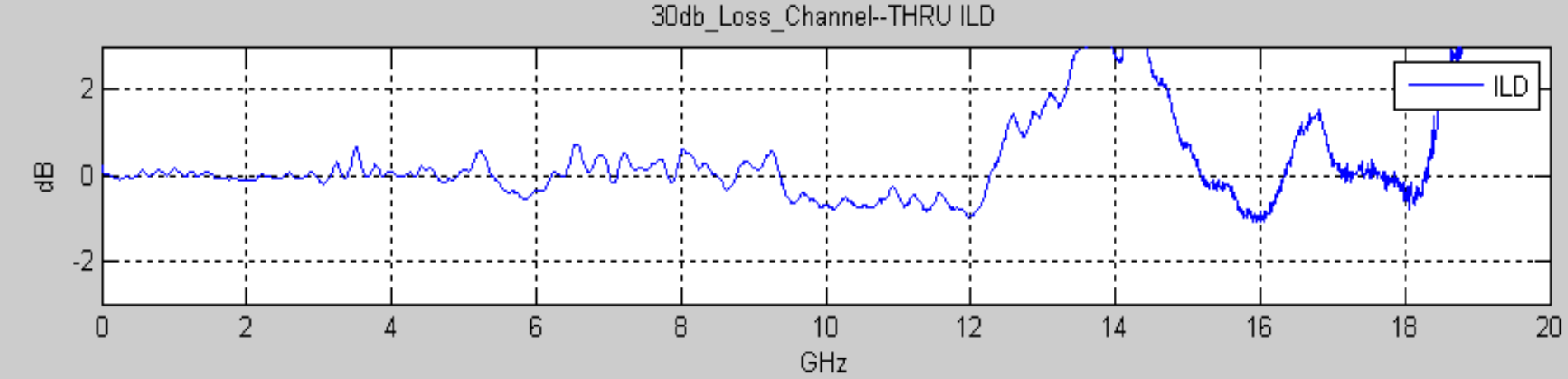




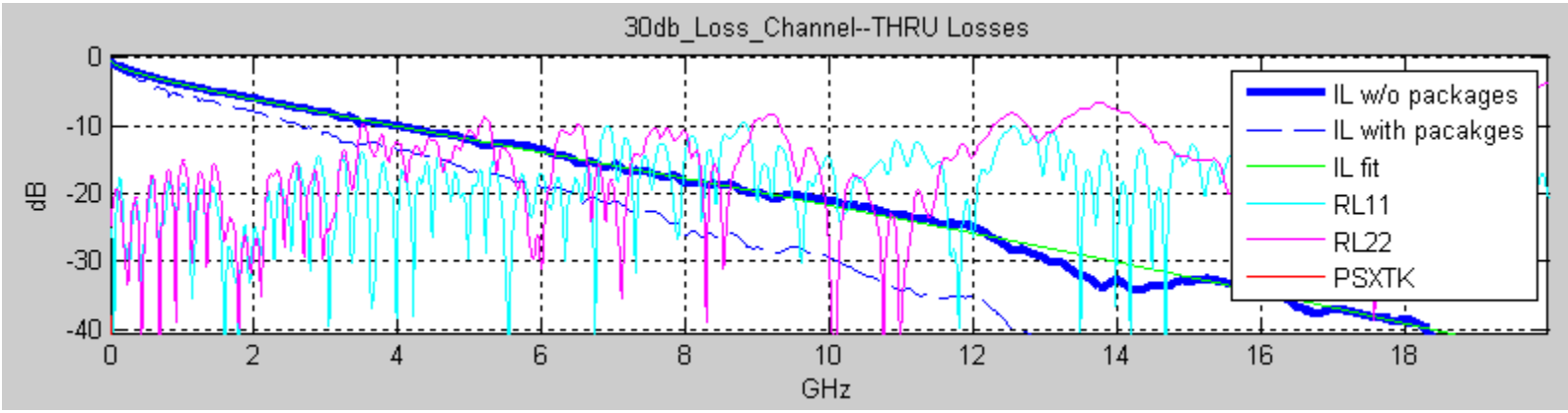
B


30db_Loss_Channel--THRU Losses
dB
-50
-100
0
2
4
6
8
10
12
14
16
18
20
GHz
IL w/o packages
IL with pacakges
IL fit
RL11
RL22
PSXTK


30db_Loss_Channel--THRU ICR
dB
80
60
40
20
0
10^{-2}
10^{-1}
10^{0}
10^{1}
10^{2}
GHz
ICR
f_{Baud}/2


30db_Loss_Channel--THRU ILD
dB
2
0
-2
0
2
4
6
8
10
12
14
16
18
20
GHz
ILD

B



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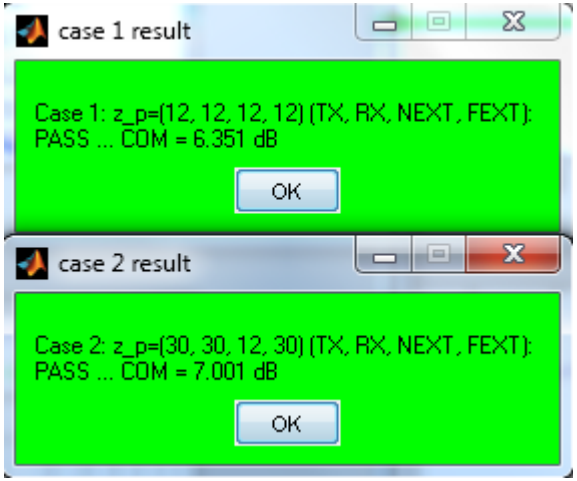
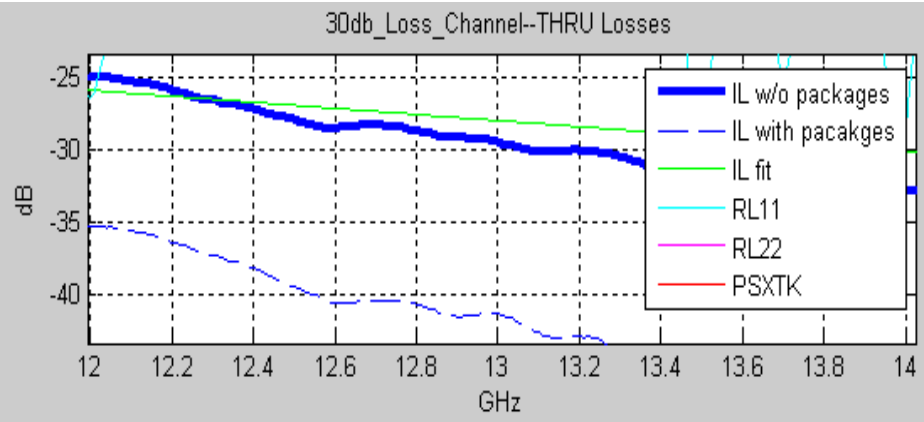
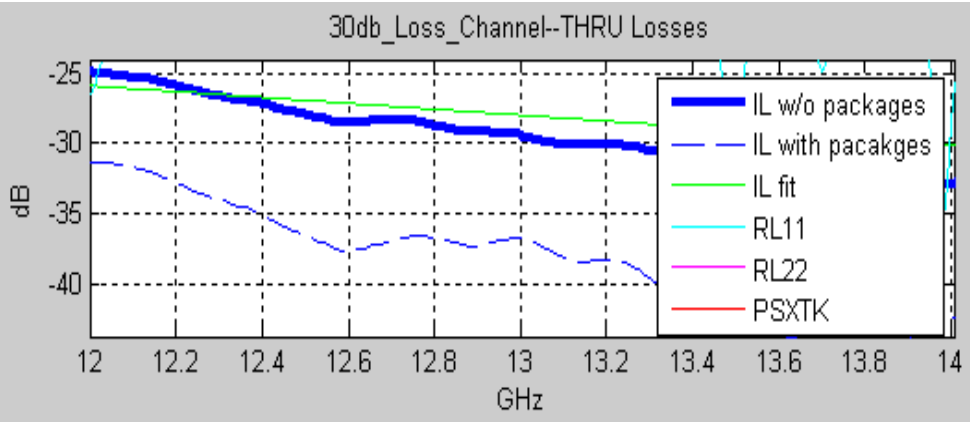
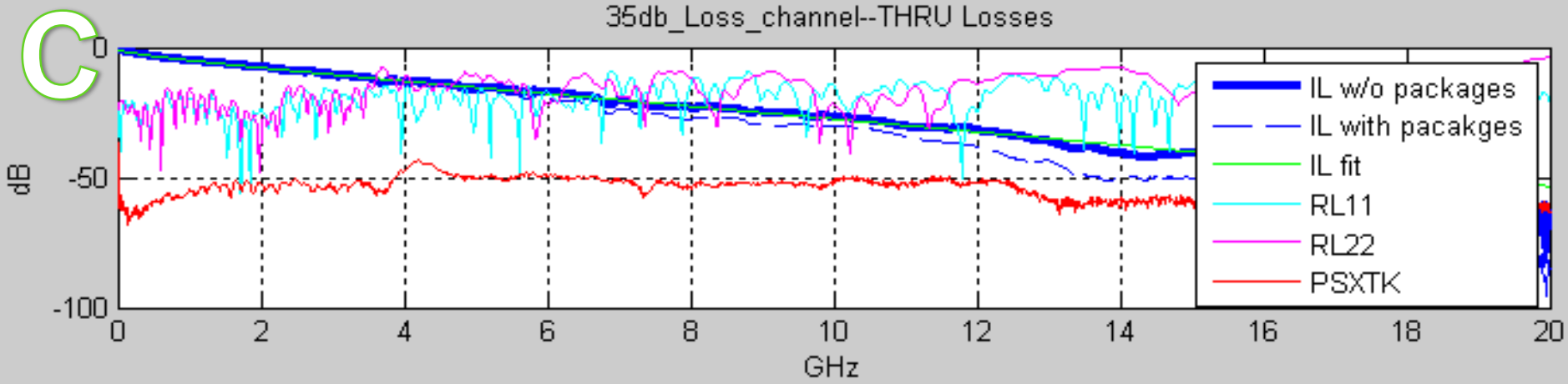
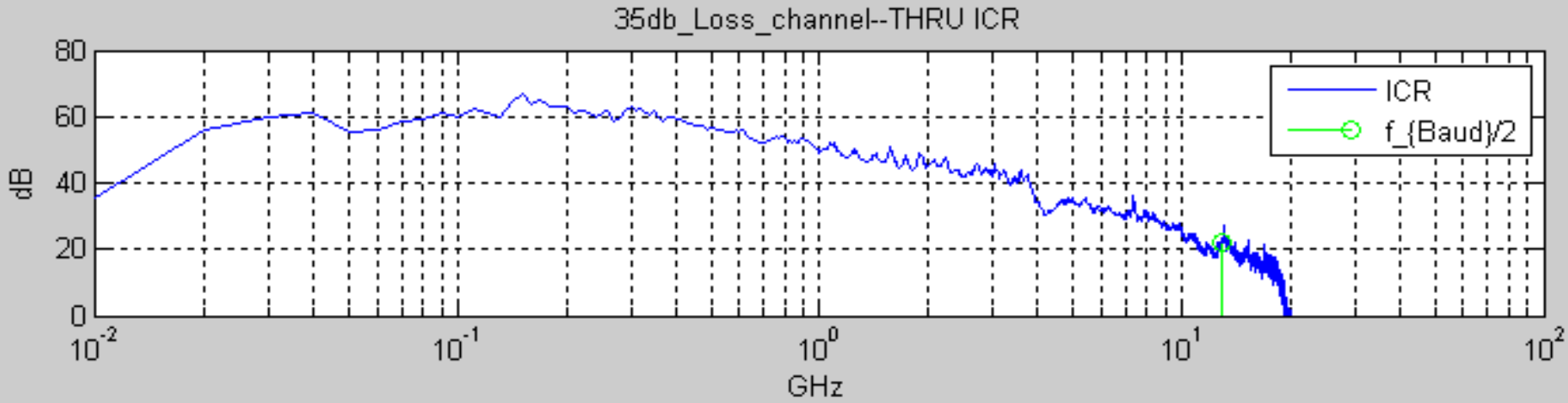


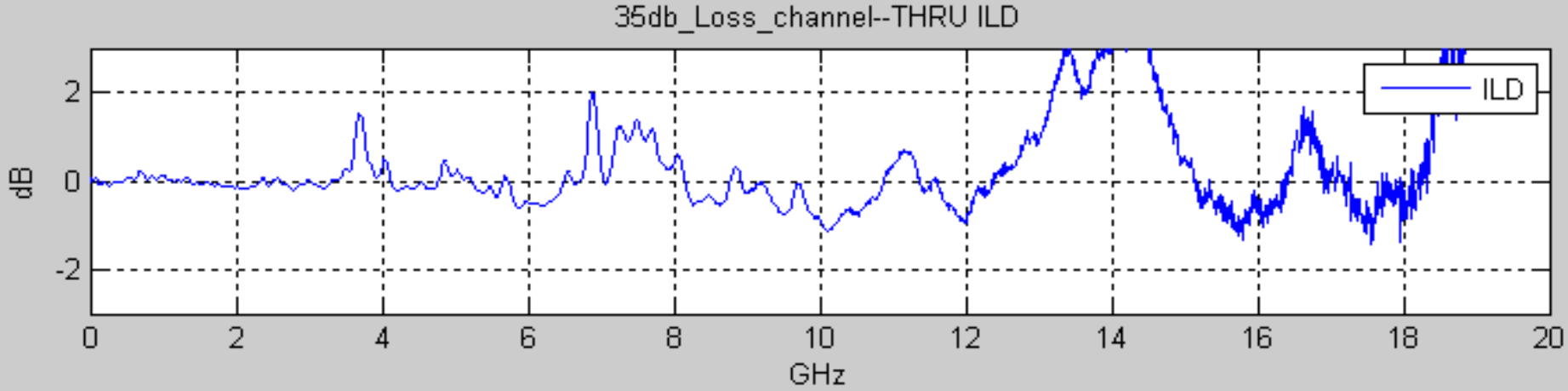




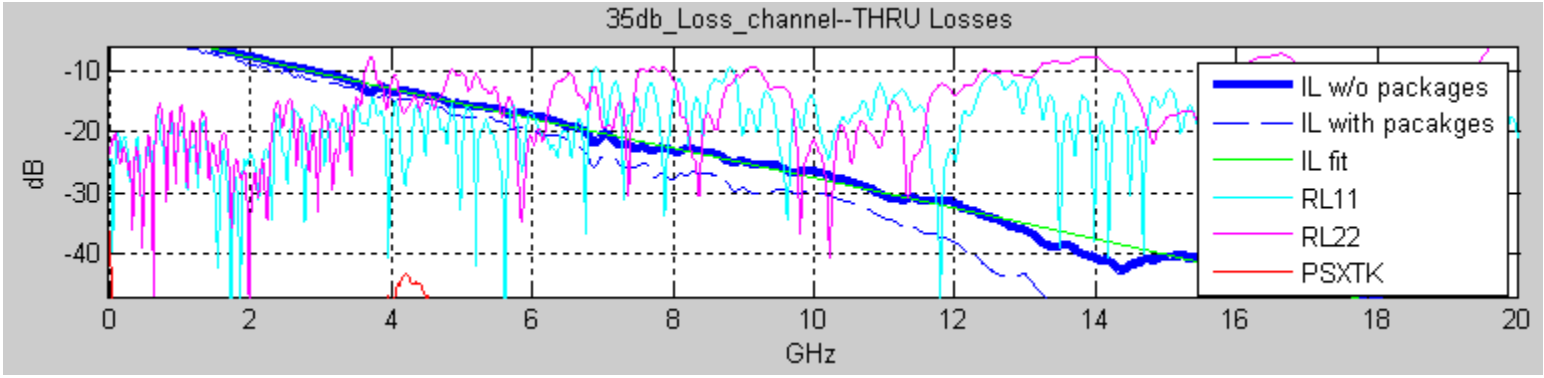
C


35db_Loss_channel--THRU Losses
dB
GHz
IL w/o packages
IL with pacakges
IL fit
RL11
RL22
PSXTK


35db_Loss_channel--THRU ICR
dB
GHz
ICR
f_{Baud}/2


35db_Loss_channel--THRU ILD
dB
GHz
ILD

C



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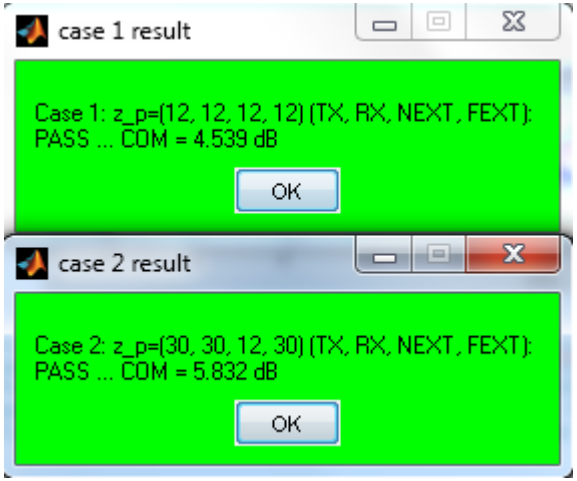
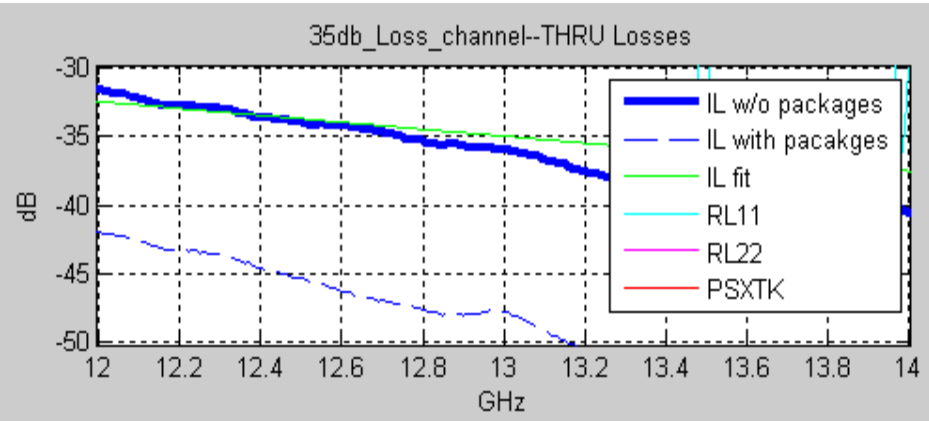
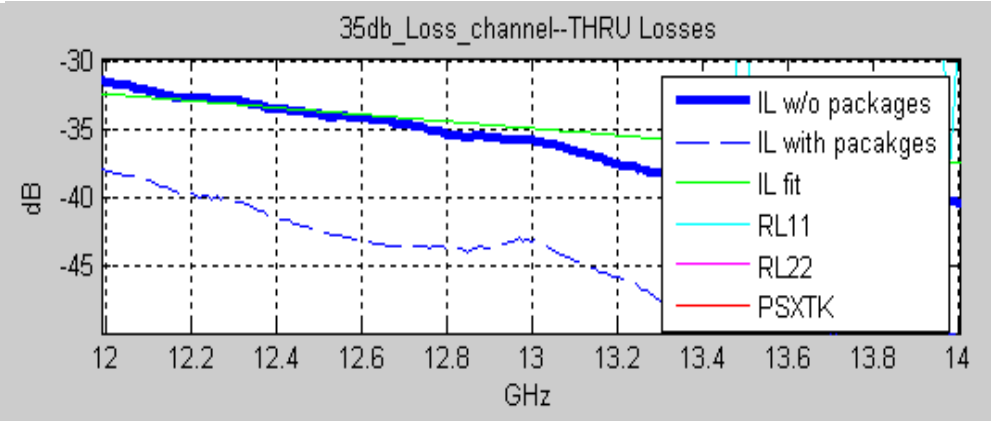
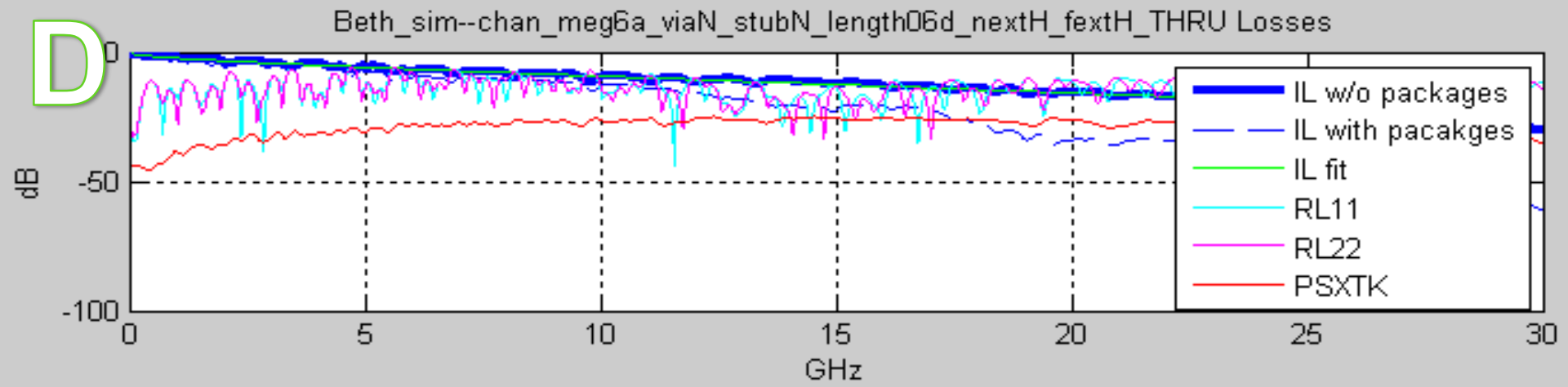
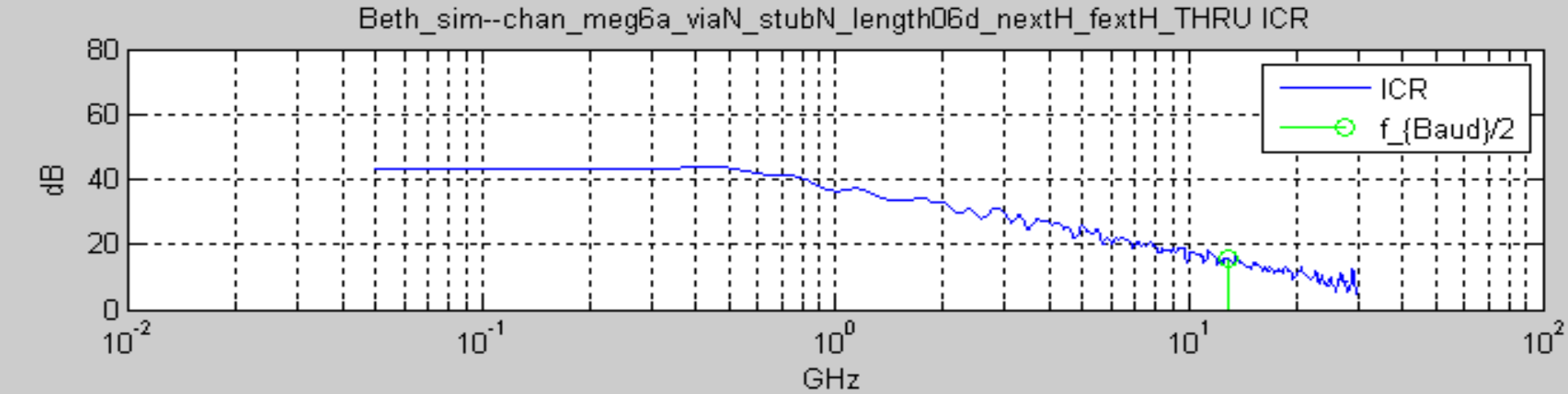


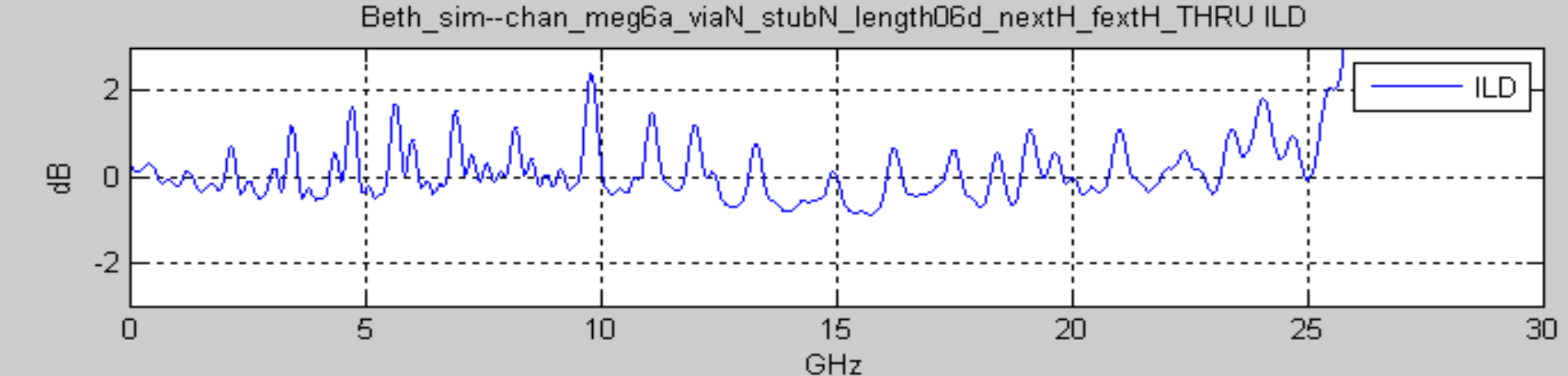




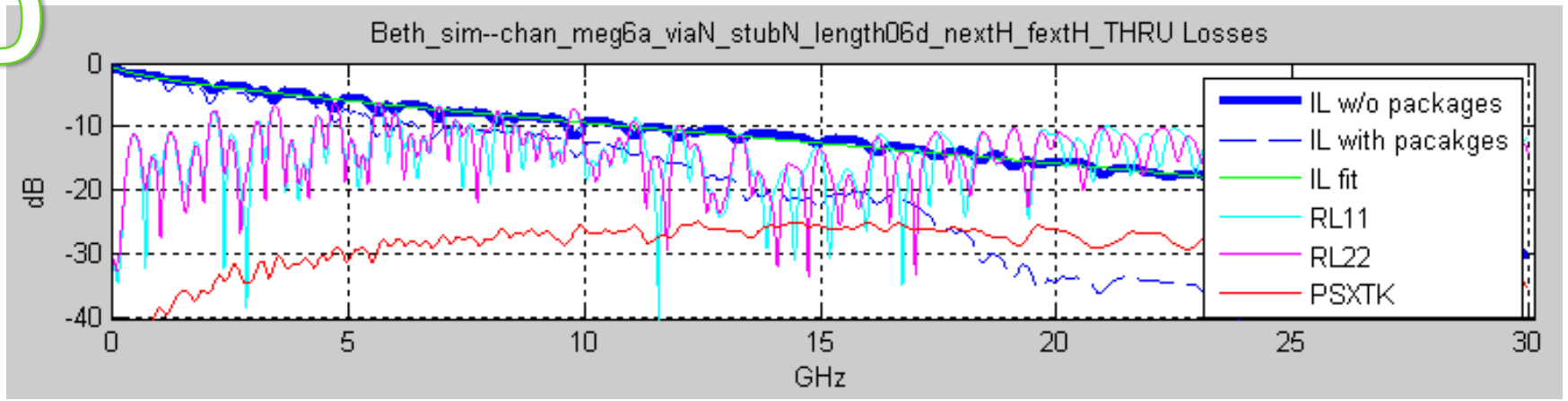
D


Beth_sim--chan_meg6a_viaN_stubN_length06d_nextH_fextH_THRU Losses
dB
0
-50
-100
0
5
10
15
20
25
30
GHz
IL w/o packages
IL with pacakges
IL fit
RL11
RL22
PSXTK


Beth_sim--chan_meg6a_viaN_stubN_length06d_nextH_fextH_THRU ICR
dB
80
60
40
20
0
10^{-2}
10^{-1}
10^{0}
10^{1}
10^{2}
GHz
ICR
f_{Baud}/2


Beth_sim--chan_meg6a_viaN_stubN_length06d_nextH_fextH_THRU ILD
dB
2
0
-2
0
5
10
15
20
25
30
GHz
ILD

D



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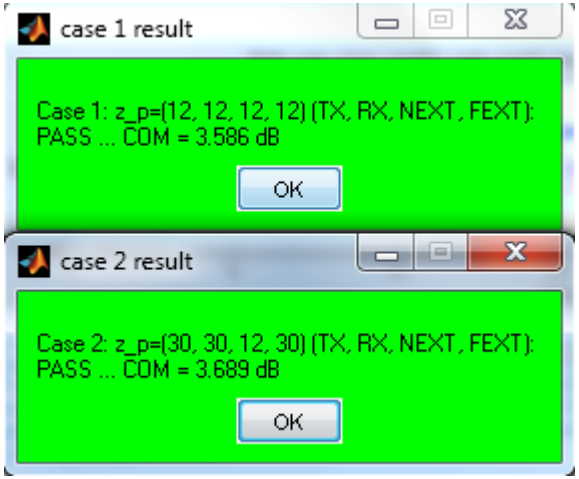
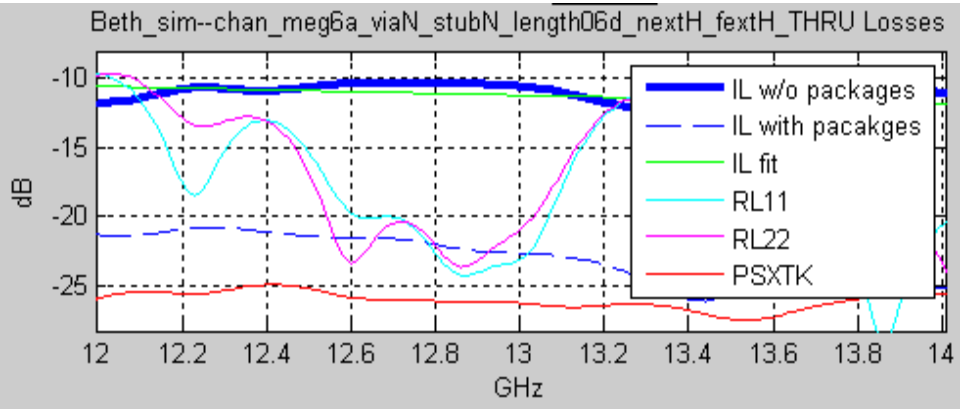
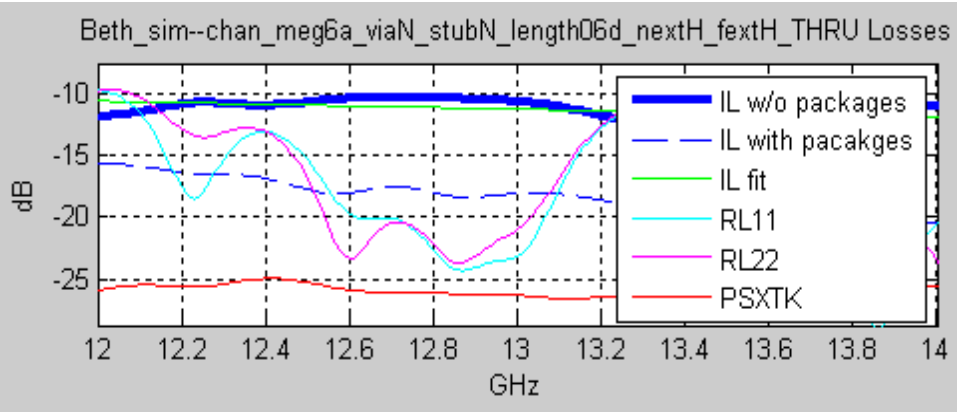
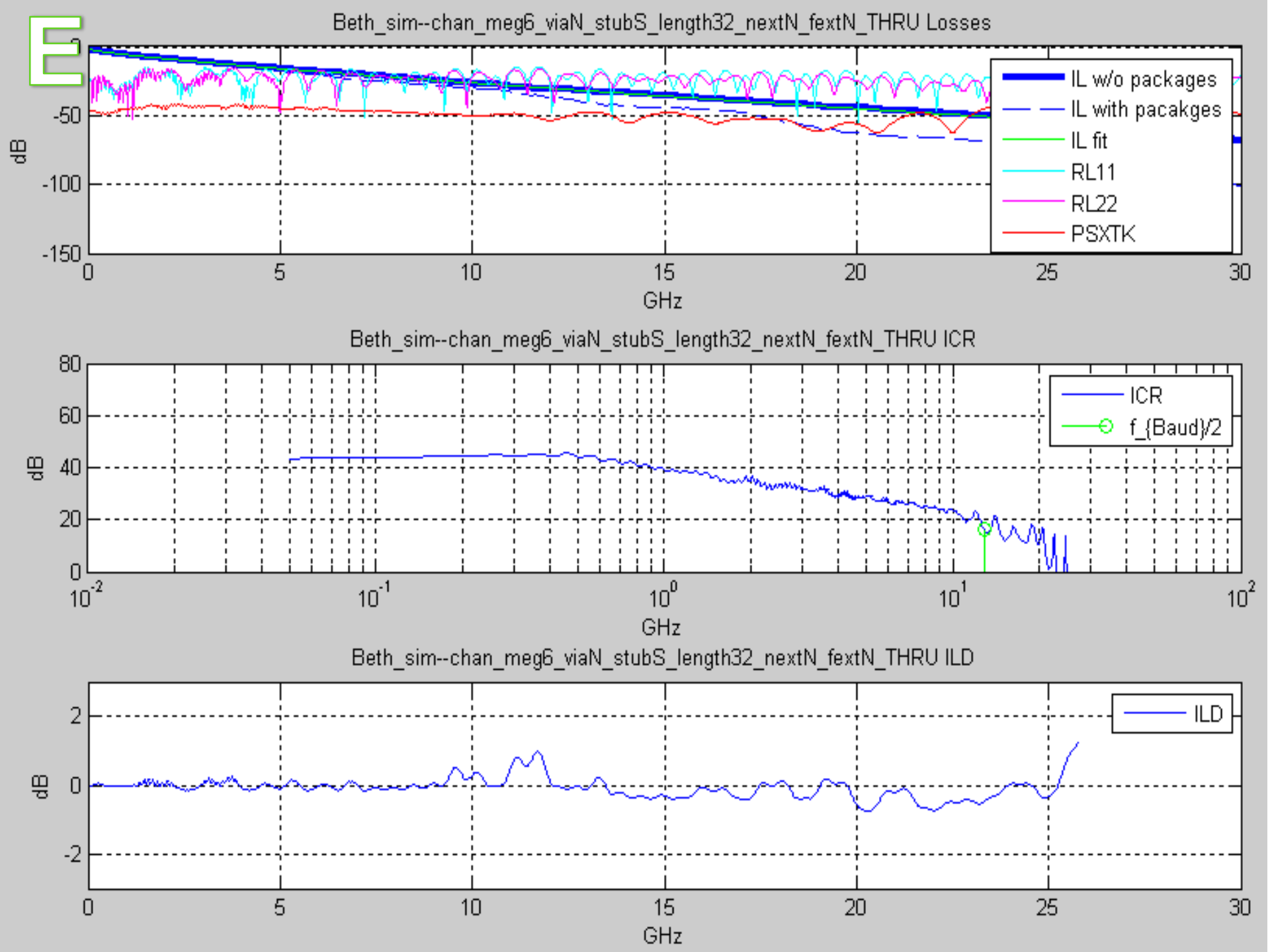
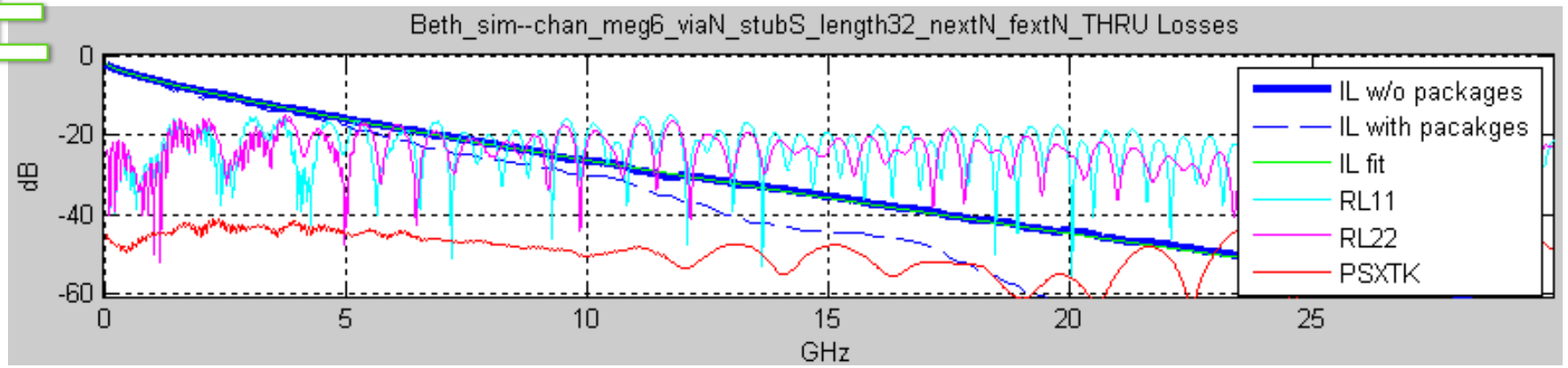







Beth_sim--chan_meg6_viaN_stubS_length32_nextN_fextN_THRU Losses
dB
GHz
IL w/o packages
IL with pacakges
IL fit
RL11
RL22
PSXTK
Beth_sim--chan_meg6_viaN_stubS_length32_nextN_fextN_THRU ICR
dB
GHz
ICR
f_{Baud}/2
Beth_sim--chan_meg6_viaN_stubS_length32_nextN_fextN_THRU ILD
dB
GHz
ILD



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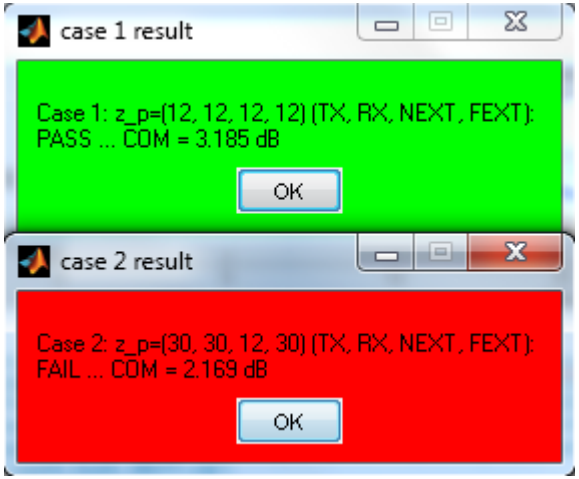

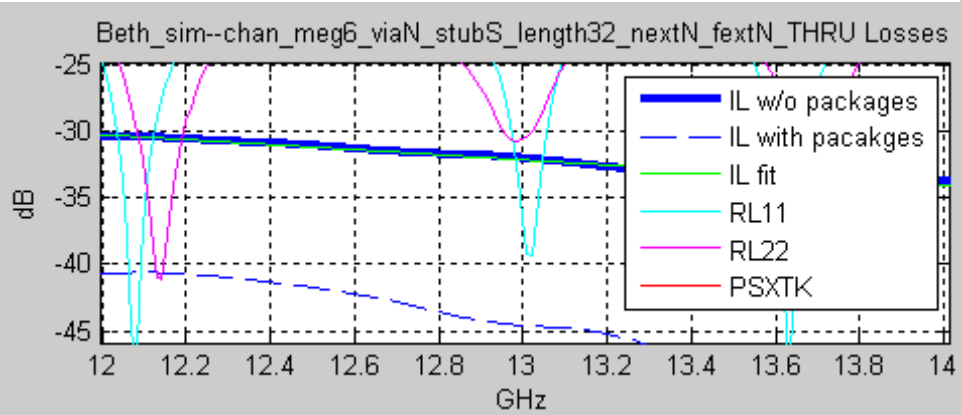

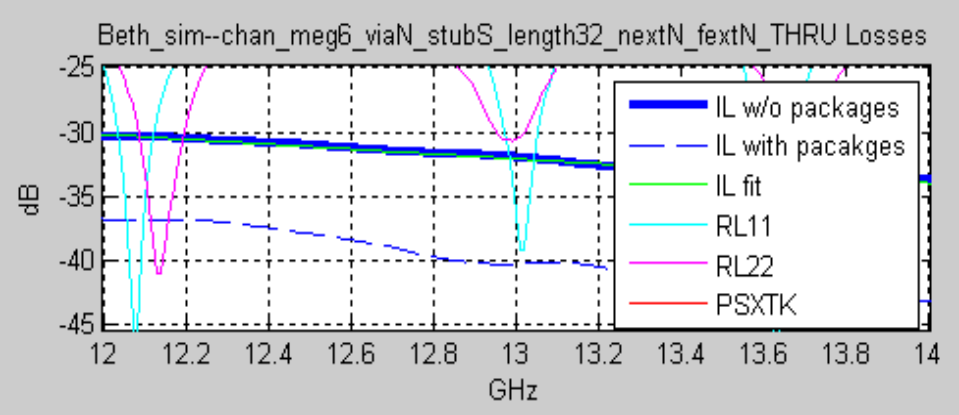

Explore Package w/SNR26

- A single package model should be used for COM. Select a REFERENCE to use and let TX/RX design account for differentiation from reference.
- Effects of 12mm and 30mm were not consistent as presenters stated in July. Statement was that 12mm would limit the reflective channels, 30mm would limit the long channels… over the sweep of channels, this was not found to be always true. Take IBM 35dB & Beth_short channels (chan C&D) for example.

SNR 26 Chan	12mm	16mm	20mm	23mm	26mm	30mm
A	6.1056	6.1516	6.2794	6.1871	6.1673	6.0293
B	5.8899	6.038	5.8971	6.0569	5.9767	6.4684
C	4.2366	4.3362	4.4225	5.1927	5.5309	5.4167
D	3.3193	3.4796	3.433	3.6923	3.6566	3.4132
E	2.926	2.7217	2.5802	2.4181	2.2028	1.9708

Explore A_{DD} w/SNR26

A_{DD} 0.047	12mm	16mm	20mm	23mm	26mm	30mm	ORIGINAL 12mm	ORIGINAL 30mm
A	6.221	6.2683	6.4172	6.3053	6.2841	6.1526	6.5869	6.5011
B	6.0226	6.1787	6.0431	6.2023	6.1183	6.6298	6.351	7.0011
C	4.3505	4.437	4.5536	5.3521	5.6967	5.5473	4.5389	5.8316
D	3.3933	3.5597	3.5149	3.7752	3.7429	3.4907	3.5858	3.6888
E	3.0362	2.8172	2.6861	2.522	2.2928	2.0585	3.1853	2.1693

A_{DD} 0.044	12mm	16mm	20mm	23mm	26mm	30mm	ORIGINAL 12mm	ORIGINAL 30mm
A	6.3331	6.3812	6.5371	6.3784	6.3955	6.262	6.5869	6.5011
B	6.2259	6.4322	6.2712	6.3502	6.2502	6.7816	6.351	7.0011
C	4.4951	4.583	4.6866	5.4981	5.8146	5.6799	4.5389	5.8316
D	3.468	3.6365	3.5931	3.8589	3.8243	3.5662	3.5858	3.6888
E	3.1353	2.9139	2.7693	2.6154	2.3381	2.1581	3.1853	2.1693

Explore σ_{RJ} & A_{DD} w/SNR26

σ_{RJ} 0.0090	12mm	16mm	20mm	23mm	26mm	30mm	ORIGINAL 12mm	ORIGINAL 30mm
A	6.12	6.1621	6.2963	6.1995	6.1742	6.0446	6.5869	6.5011
B	5.9054	6.0579	5.9194	6.068	5.9884	6.493	6.351	7.0011
C	4.2508	4.3505	4.437	5.2086	5.5473	5.4329	4.5389	5.8316
D	3.3265	3.4876	3.4398	3.7	3.6652	3.4212	3.5858	3.6888
E	2.9382	2.7335	2.5919	2.4296	2.214	1.9708	3.1853	2.1693

A_{DD} 0.047 σ_{RJ} 0.0095	12mm	16mm	20mm	23mm	26mm	30mm	ORIGINAL 12mm	ORIGINAL 30mm
A	6.2259	6.2737	6.4232	6.3116	6.291	6.1526	6.5869	6.5011
B	6.0462	6.1888	6.1282	6.2136	6.1302	6.6298	6.351	7.0011
C	4.3649	4.4515	4.5536	5.3521	5.6967	5.5473	4.5389	5.8316
D	3.397	3.5638	3.5172	3.7804	3.7458	3.4934	3.5858	3.6888
E	3.0485	2.8172	2.6861	2.5336	2.3041	2.0585	3.1853	2.1693

Thank you.