

C2M Update – December 2018

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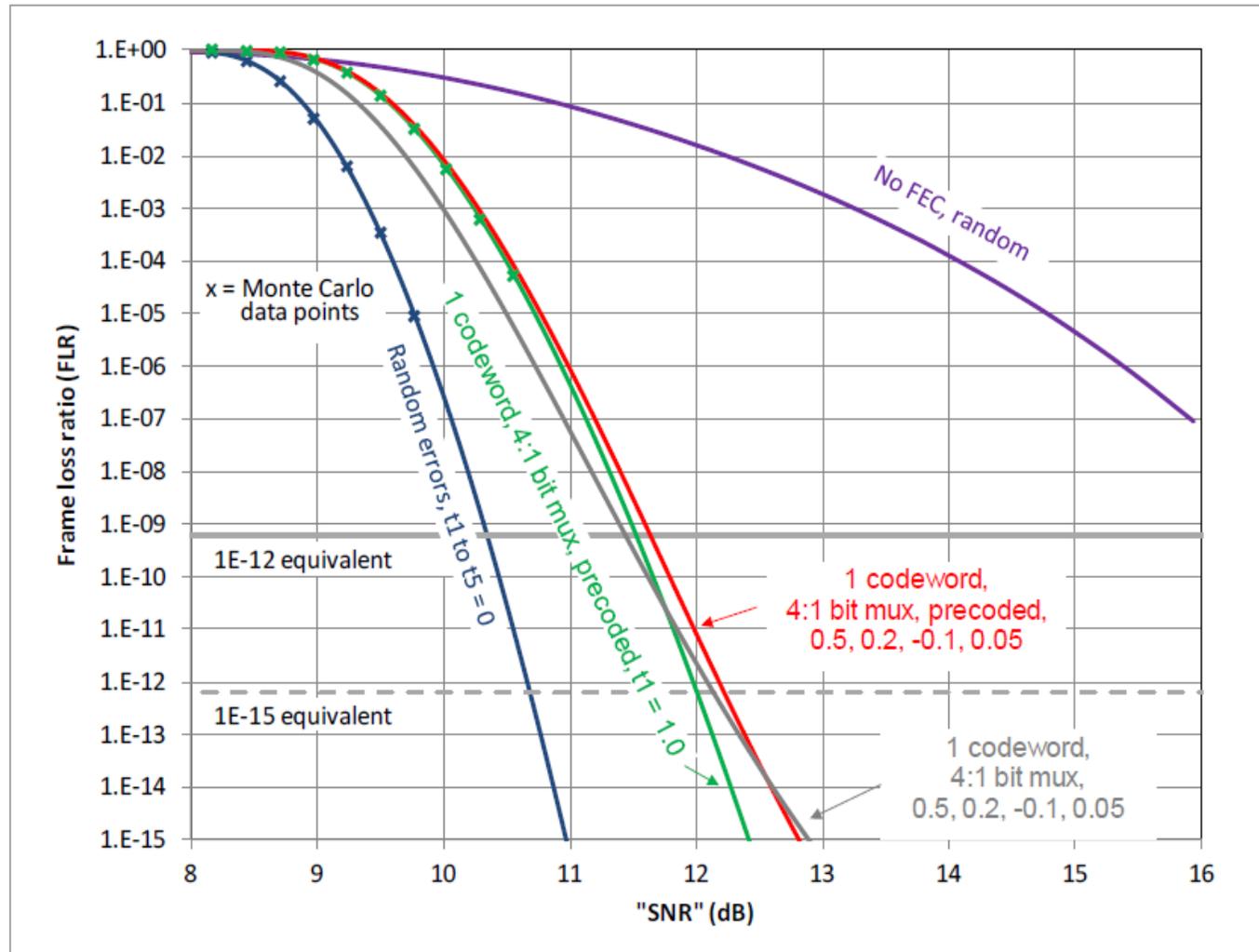
Progress Since 2018 November Plenary

- Limiting the C2M RX to a four tap DFE with constraints appears to reduce the impact of DFE error propagation (and the need for FEC interleaving, in particular on 100GAUI-1)
- The current proposed C2M DFE limits for Receiver A's multi-tap DFE are:
 - $0 < t1 < 0.5$
 - $-0.05 \leq t2 \leq 0.2$
 - $-0.1 \leq t3 \leq 0.1$
 - $-0.05 \leq t4 \leq 0.05$
- COM analysis shows both the Receiver A (4-tap DFE) and Receiver B (5-tap RXFFE + 1-tap DFE) architectures can close the contributed C2M channels with the “simple” 30mm package

RS(544) Performance for 100GAUI-1 C2M

100G with 4-tap DFE (0.5, 0.2, -0.1, 0.05)

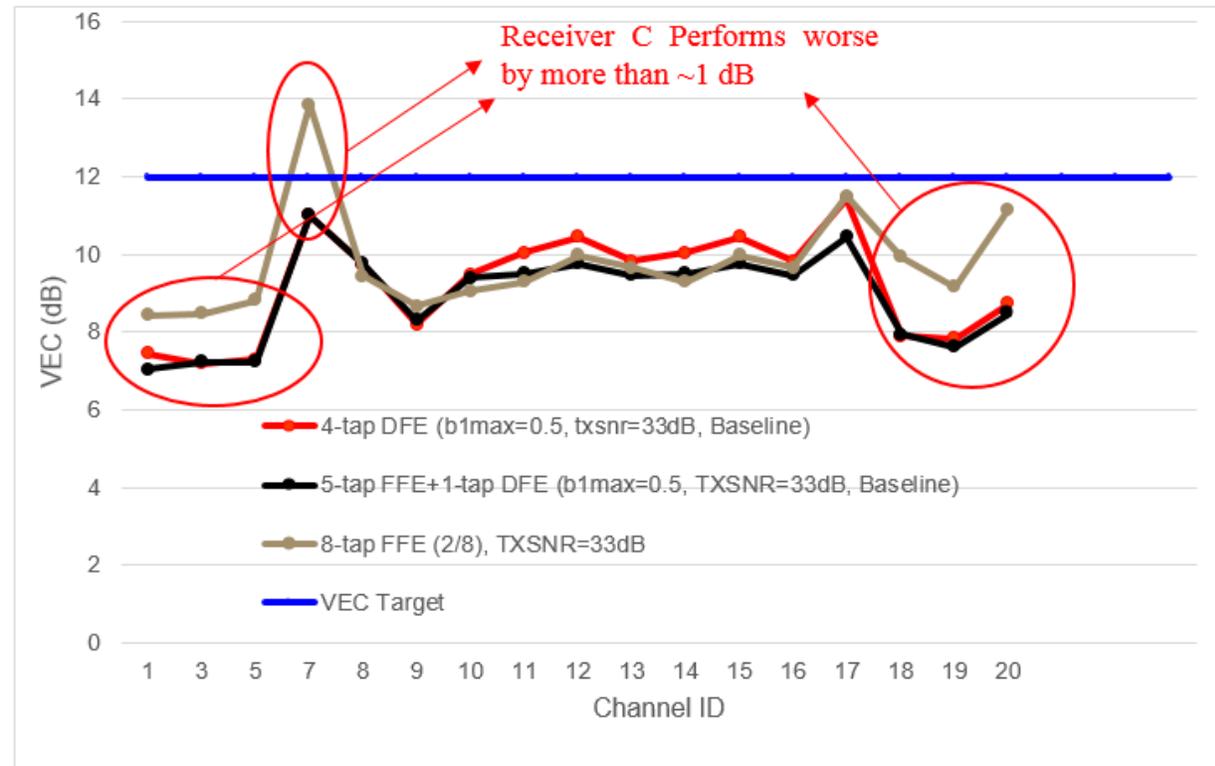
Data courtesy of Pete Anslow



C2M Channel Coverage

- Comparison of VEC over the submitted C2M channels shows similarity in performance over different RX equalizer architectures

Baseline Simulation Results



- Both receivers A and B can support all 17 target channels.
- Receiver C cannot support channel #7 and has less margin than other receivers on channel #17.
- Channel #7 and #17 are relatively harder for all receivers.

Data courtesy of Phil Sun

Looking forward

Challenges

- Uncertainty of total loss in reference package model (feasibility of lower loss per mm, required package route lengths, etc)
- Limited resources available to perform the work; need help running experiments

Next Steps

- Repeat COM analysis with the candidate reference package model(s)
- Continue to investigate and refine the COM parameters required to support the targeted C2M channels for each proposed RX equalizer
- Compare the RX performance sensitivity to equalizer settings (i.e. impact due to missing the best EQ by one or two steps.)

Thanks!

Post Spokane Interim Meeting Summary

- The results of Straw Polls #1-3 show that there is growing consensus to not pursue a C2M direction of Option C/D/E/F at this time.
- Therefore, focus is shifting to examine the feasibility of Option B as well as compare the merits of Option A vs. Option B.
- Based on feedback from participants, there are aspects of the C2M direction that need contributions:
 - COM parameters required to support the targeted C2M channels
 - RX performance sensitivity to equalizer settings (i.e. impact due to missing the best EQ by one or two steps.)
 - Analysis showing RX DFE tap weights where the error propagation effect becomes prominent
 - Channel property changes as a function of environmental effects (i.e. temperature, humidity, etc)
 - More measured channels from system vendors that represent the end-to-end path (TP0-TP1a), including “short” channels
 - System vendor feedback and alignment on critical channel priority
 - Power, complexity and relative cost comparisons of Option B vs. Option A
 - Power and complexity estimates of adding “in band” signaling to a module

802.3ck C2M Channels

NEW SLIDE

Channel ID	Channel Description	Insertion Loss at 26.5625GHz (dB)	ERL (dB)
1	mellitz_3ck_01_0518_C2M\9dB	8.945554	10.97348
2*	mellitz_3ck_01_0518_C2M\10dB	9.95607	6.511964
3	mellitz_3ck_01_0518_C2M\11dB	11.16053	11.02587
4*	mellitz_3ck_01_0518_C2M\12dB	12.18229	6.962815
5	mellitz_3ck_01_0518_C2M\13dB	13.12136	11.12536
6*	mellitz_3ck_01_0518_C2M\14dB	13.86565	7.377215
7	tracy_100GEL_02_0118\long_barrel_via\TX5	16.48338	8.061464
8	tracy_100GEL_02_0118\long_barrel_via\TX6	16.08129	9.70108
9	tracy_100GEL_06_0118\Microvia\RX6	14.5928	8.436388
10	tracy_100GEL_06_0118\Microvia\RX5	14.56797	9.698426
11	lim_100GEL_02_0318\10dBa	10.0301	10.36542
12	lim_100GEL_02_0318\12dBa	12.12298	10.50985
13	lim_100GEL_02_0318\14dBa	13.96456	10.55365
14	lim_3ck_01_0718\10dB	10.0301	10.36542
15	lim_3ck_01_0718\12dB	12.12298	10.50985
16	lim_3ck_01_0718\14dB	13.96456	10.55365
17	lim_3ck_01_0718\16dB	15.89888	10.58885
18	llim_3ck_01_0918_QDD_new_pairs\12dB	12.19198	11.42111
19	llim_3ck_01_0918_QDD_new_pairs\14dB	13.98771	11.64061
20	llim_3ck_01_0918_QDD_new_pairs\16dB	15.95873	11.70053

- ***Target Channels:** channel 2, 4, and 6 require powerful receiver. This study aims to support all other 17 channels.

Data courtesy of Phil Sun