

Study of Center Launch Specification and Analysis of Draft D2.2 TP3 Stressors

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Objectives

- Evaluate impact of additional 4 and 5 μ m offsets on coverage, to understand the possible impact of the relatively loose center launch specification in the Draft.
- To determine the dispersion penalties versus MMF link lengths:
 - **Using the Gen67yy fiber model**
 - **Using cutback $\gamma=1.0$ and $\lambda=1300\text{nm}$**
 - DFE Architectures: Infinite-length, 12+5, 8+3, 12+0 Tap DFEs
 - Duplex (2-connector x 1-connector) penalties
 - Link lengths computed: 160m, 220m and 300m
- Identify the maximum link length corresponding to the latest set of TP3 stressors at 99% coverage:
 - Precursor IPR 14
 - Postcursor IPR 15
 - Split-symmetric IPR 5

Duplex (2conn x 1conn) 99%tile Coverage Comparison

Ideal, infinite-length DFE, 220m Fiber

Gen67yy uncorrected ($\gamma = 1.0$)

PIE-D	Offset launch	Center Launch	Joint Launch
0-3 μm	4.94	5.54	4.13
0-4 μm		5.59	4.13
0-5 μm		5.65	4.13

- Joint Launch remains unaffected by the relaxation of the center launch to include 4,5 μm offsets

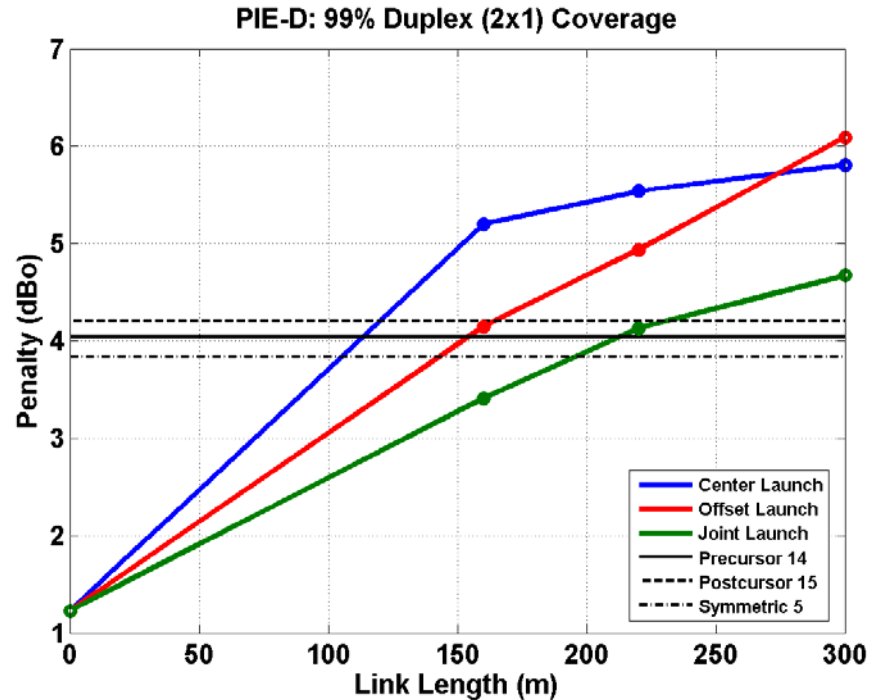
Infinite-Length DFE: 99% Duplex (2x1) Coverage

Max. Link Length (m)
at 99% Coverage

	Pre-14	Post-15	Symm-5
Center Launch	113	120	105
Offset Launch	154	164	143
Joint Launch	212	231	195

Penalty to reach specified
distance at 99% Coverage

PIE-D	160m	220m	300m
Center Launch	5.2	5.54	5.81
Offset Launch	4.15	4.94	6.09
Joint Launch	3.41	4.13	4.67



- A link of 0m corresponds to the back-to-back penalty (~1.23dBo)
 - Applies to all launch conditions
- Linear interpolation used to estimate maximum link lengths
- At extremely long link lengths, penalties for all 3 launches will approach a maximum for that launch:
 - At longer lengths, all the individual modes are resolved and hence PIE-D will not worsen any more with link length
 - This will not happen for finite architectures
 - Performance saturation occurs earlier for center launch than for offset launch
 - Expected since fewer mode groups are excited

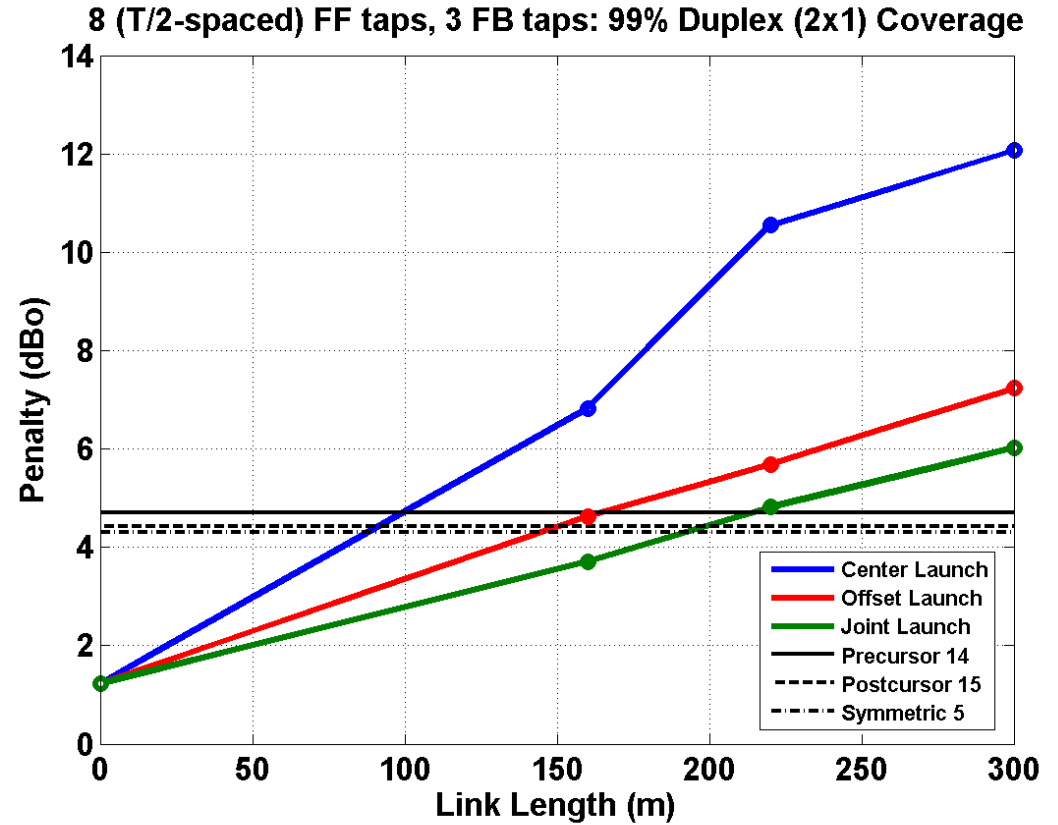
8 (T/2-spaced)FF + 3FB Tap DFE: 99% Duplex (2x1) Coverage

Max. Link Length (m)
at 99% Coverage

	Pre-14	Post-15	Symm-5
Center Launch	99	91	88
Offset Launch	164	150	145
Joint Launch	214	198	192

Penalty (dBo) to reach specified
distance at 99% Coverage

Penalty (dBo)	160m	220m	300m
Center Launch	6.83	10.55	12.07
Offset Launch	4.63	5.69	7.24
Joint Launch	3.71	4.82	6.02



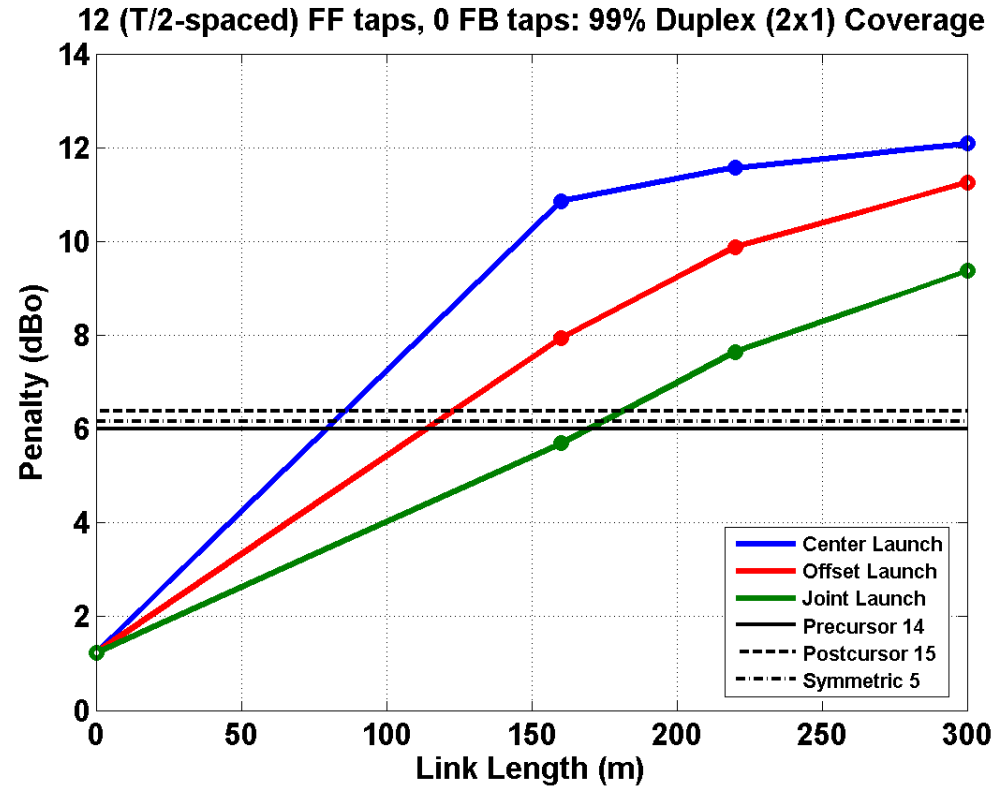
12 (T/2-spaced)FF + 0FB Tap DFE: 99% Duplex (2x1) Coverage

Max. Link Length (m)
at 99% Coverage

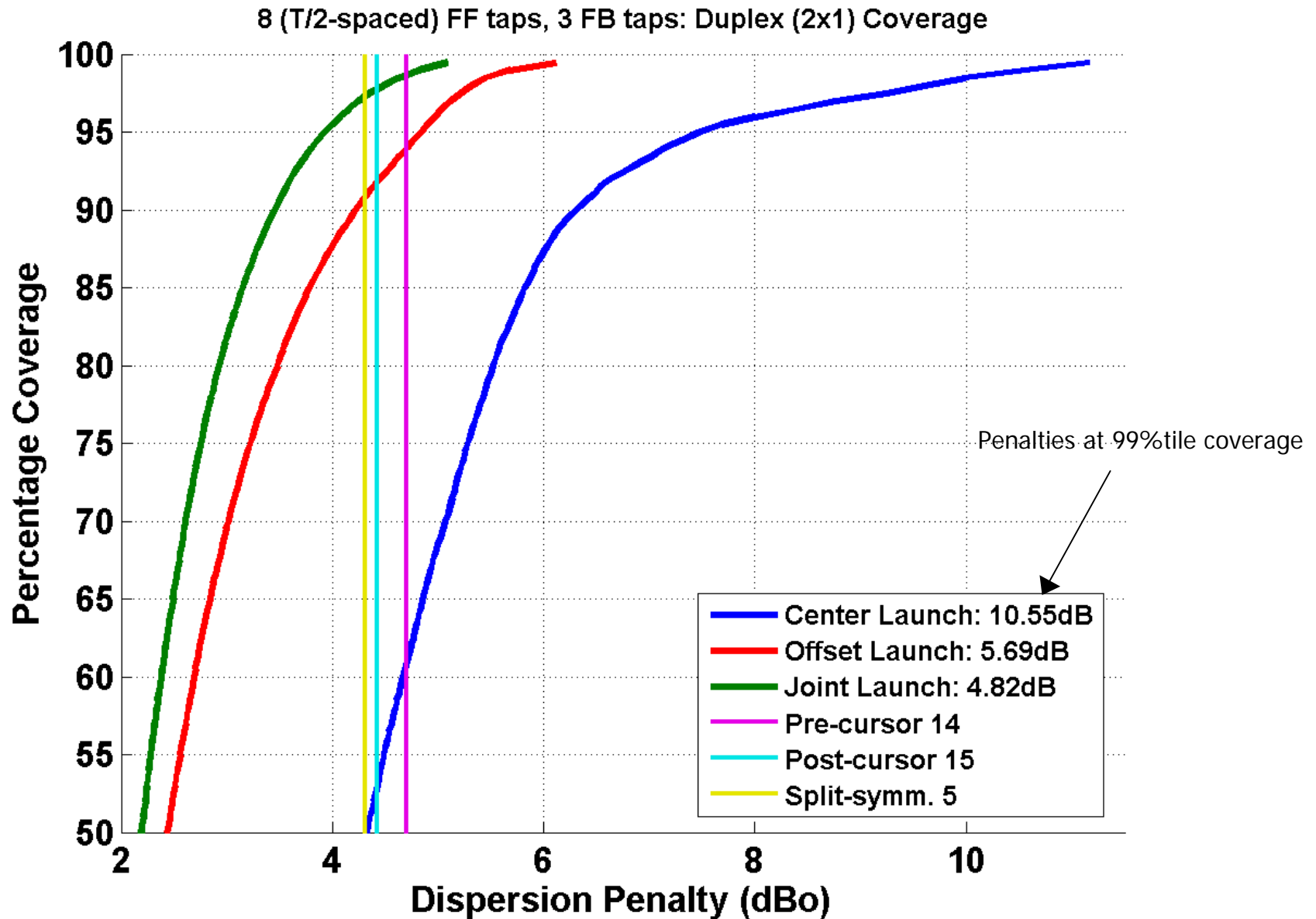
	Pre-14	Post-15	Symm-5
Center Launch	79	86	82
Offset Launch	114	123	118
Joint Launch	170	181	174

Penalty to reach specified
distance at 99% Coverage

	160m	220m	300m
Center Launch	10.86	11.57	12.09
Offset Launch	7.94	9.88	11.26
Joint Launch	5.69	7.64	9.37



Duplex (2x1) Coverage Curves for 8+3 DFE Architecture at 220m

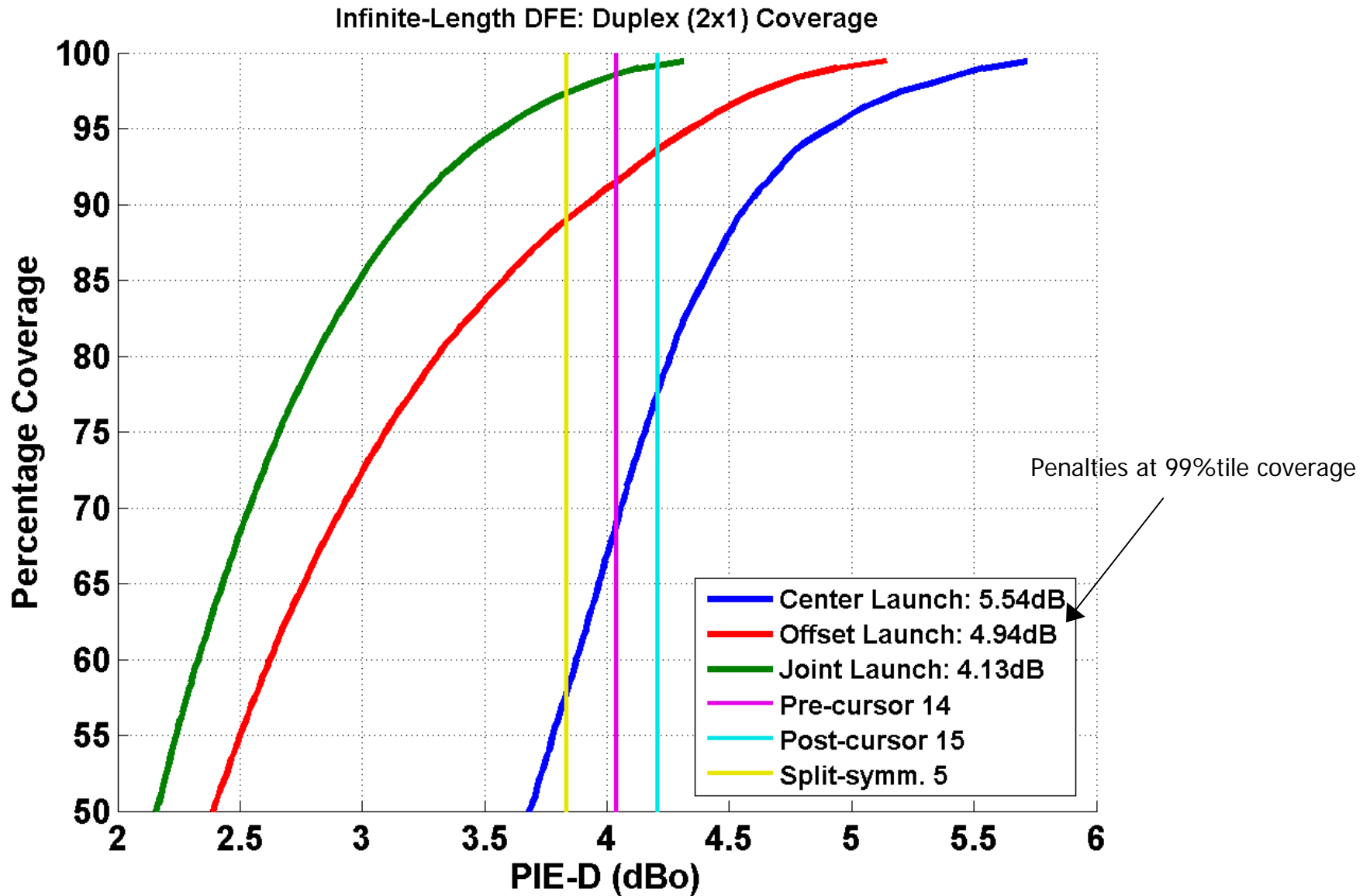


Conclusions

- The loose tolerance in the center launch specification has only a small impact on center launch coverage and practically no impact on joint launch coverage, primarily because the effect of connectors dominates.
- Even at 220m, the inclusion of center launch in the standard may result in a high rate of frustration in the field, since it will likely be the *de facto* first launch attempted.

Back Up Slides

Duplex (2x1) PIE-D Coverage Curves for 220m



Duplex (2x1) Coverage Curves for 12-tap Linear Equalizer at 220m

