

Proposal for DFE Constraints

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Case 4 Probability Calculation:

- There was a question on the 3x error propagation of [sun_3by_01_0515.pdf](#).
- Due to the 3x error multiplication effect of the descrambler, the cases for a burst or its alias to cause case 4 corruption without being detected is $5+7+8=20$. This includes 5 cases corrupted by the original burst, 7 from the first alias, and 8 from the second alias. This corresponds to a factor $20/8=2.5$, which was rounded to 3 in [sun_3by_01_0515.pdf](#).
- The total probability for case 4 to happen is: $P_T = \text{DER} * P_{EP}^3 * (1 - P_{EP}) * 2.5$.
- Rounding from 2.5 to 3 slightly modifies MTTFPA results by a factor of 1.2. This does not affect any bottom line results of [sun_3by_01_0515.pdf](#).

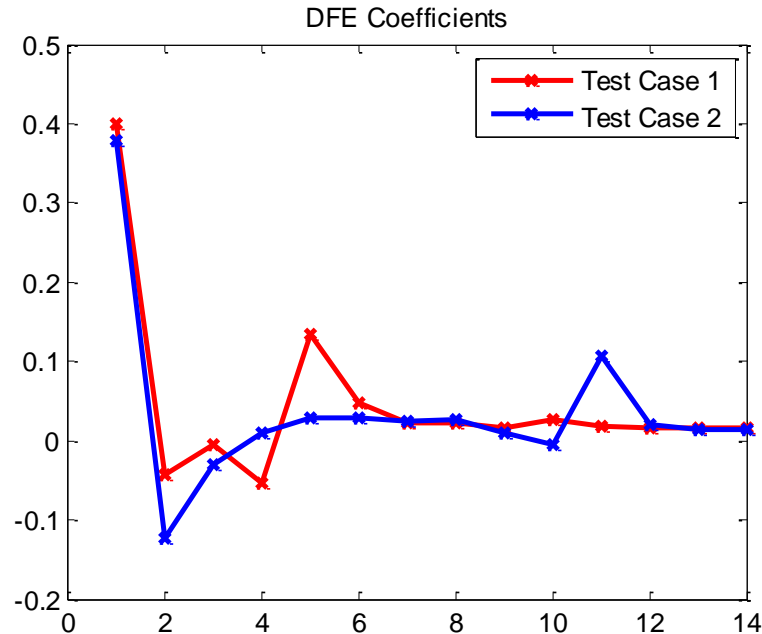
TE 3m Cable Results

AWG	DFE Constraints	Test Case 1		Test Case 2	
		COM	DFE b1 Tap Weight	COM	DFE b1 Tap Weight
26	No	3.118	0.565	2.342	0.422
	Bmax(1)=0.35 Bmax(2...n)=0.1	2.855	0.35	2.333	0.34
	Bmax(1)=0.4	3.191	0.40	2.322	0.38
	Bmax(1)=0.35	3.190	0.35	2.333	0.33

- The most interested cable is 26AWG.
- The victim is P2_TX2 in [7].
- This table compares the impact of different DFE constraints.
- There is very minor COM loss for test case 2 which is the limiting test case.

Error Propagation Analysis

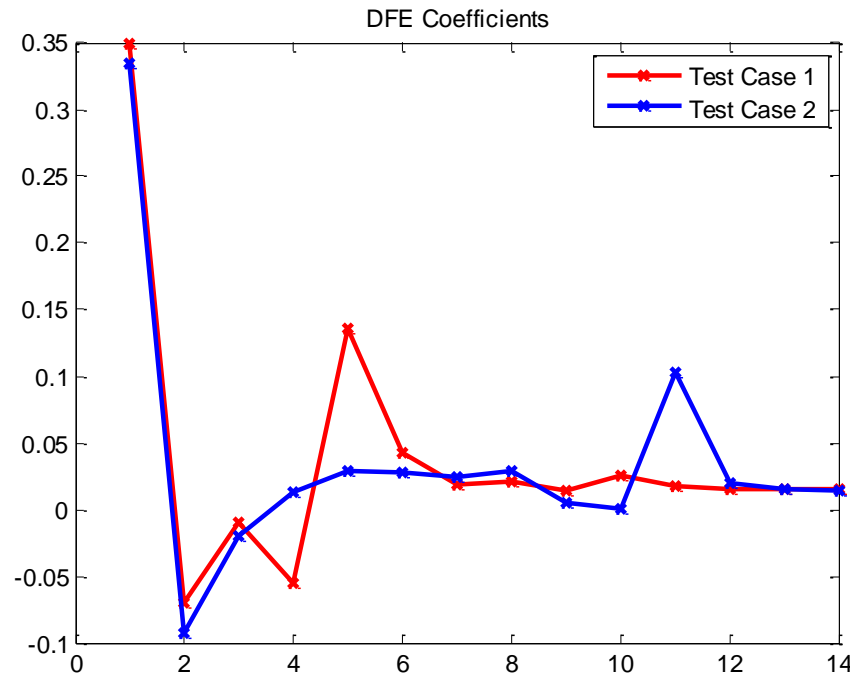
- If only constraint $b1_{max}=0.4$, DFE coefficients are:



- The probability to have burst 4'1111 is larger than a single tap DFE with $b1=0.41$.
 - Test case 1: $3e-3 > 1e-4$
 - Test case 2: $9e-4 > 1e-4$

Error Propagation Analysis

- If only constraint $b1_{max}=0.35$, DFE coefficients are:



- The probability to have burst 4'1111 is larger than a single tap DFE with $b1=0.41$.
 - Test case 1: $3e-5 < 1e-4$
 - Test case 2: $2e-5 < 1e-4$

Conclusions and Proposals:

- With DFE error propagation, MTTFPA fails at $DER=1e-12$.
- We suggest to set COM parameters: $b_{max}(1) < 0.35$.