

DER_DFE Equation in the “MLSE_U1_c_178A” function of the COM Matlab Code

COM Commit Request Numbers 4p7_5

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Introduction

- This request is relative to COM 480beta2
- Contribution [lim_3dj_02_2405.pdf](#) explained re-writing MLSE equation U1.c to use IEEE 802.3 standard definition of DER (see [healey_3dj_01a_2311.pdf](#))
- In a recent review of the Matlab COM code, it was noticed that this definition was not applied to the DER equation for DFE
 - ❖ DER_DFE is not used anywhere in the calculations in the code and is only reported as an FYI parameter in the “MLSE_results” field for comparison to DER_MLSE
 - ❖ Current equation continued to use the probability of a symbol error event (the initial error in an error burst) (see [healey_3dj_01a_2311.pdf](#))
- For consistency, it is suggested that the DER_DFE equation also uses the standard definition of DER (detector error ratio)
- Note that this change will not affect any of the results, rather is only for technical correctness and consistency


Change

- Change 1 line to remove the multiplying factor $2(L-1)/L$ from the DER_DFE equation

```
2170 - | DER_DFE= 2*(L-1)/L*CDF_ev(A_s,PDF, CDF);
```

480beta2

Remove



Example Outputs

- For one example channel:

Before Change	After Change
CDF: [1x8573 double]	CDF: [1x8573 double]
PDF: [1x1 struct]	PDF: [1x1 struct]
DER_MLSE_trunc: 0.0072	DER_MLSE_trunc: 0.0072
Q_budget_adj: 0	Q_budget_adj: 0
COM_from_matlab: -0.7485	COM_from_matlab: -0.7485
DER_MLSE: 0.0072	DER_MLSE: 0.0072
DER_DFE: 8.8608e-04	DER_DFE: 5.9072e-04
COM: -0.1852	COM: -0.1852
delta_com: 0.5633	delta_com: 0.5633
g_an: 0.6510	g_an: 0.6510

Thank You 😊

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