

COM Commit Request 4p13_1

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IEEE 802.3 Channel Operating Margin (COM) Open Source Project Ad Hoc

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Purpose for Commit Request

□ COM Commit Request 4p13_1

- remove σ_x^2 for S_{tn} calculation to align d1.4+
- σ_x^2 (sigma_x2) was removed in the computation for transmitter spectral density, $S_{tn}(\theta)$ (eq. 178A–18) in draft 1.4 but not implemented in COM.
- Expected impact is to reduce COM 4.13.0 by up to 0.4 dB

Code updates :

- ❑ Commit Request 4p13_1
- ❑ 2 src files updated
 - [get_PSDs.m](#)
 - [read_paramConfigFile.com](#)
- ❑ New Keyword: `S_tn_w_AM`
 - 0: `S_tn` without σ_x^2 for d1..4+
 - 1: (default) `S_tn` with σ_x^2 for pre-d1.4
- ❑ 1 test file added*
 - [com_ieee8023_4p13p0_S_tx_bug.m](#)

```
src/get_PSDs.m
... @@ -177,7 +177,9 @@ else % find noise for item that set have tx ffe
for each loop
177     hext=htn(1:num_ui);
178     end
179
180 -     result.S_tn=sigma_X2*10^(-SNR_TX/10)*
( abs(fft(hext))).^2/param.fb; % this corresponds to +/- pi
...
181     result.S_tn_rms = sqrt(sum(result.S_tn)* delta_f);
182     else
183     result.S_tn=result.S_tn.*H_rxffe_2;
...

src/read_ParamConfigFile.m
... @@ -262,6 +262,7 @@ param.trunc = xls_parameter(parameter, 'N_tc',
true, param.trunc); % MLSE sequen
262 % healey_3dj_01a_2407 adjust MLSE for COM_DFE
263 param.Q_budget_adj = xls_parameter(parameter, 'Q_budget_adj', true,
0); % MLSE sequence truncation length
264 param.SNDR = xls_parameter(parameter, 'SNR_TX', true); % Transmitter
SNDR noise in dB
...
265 param.R_LM = xls_parameter(parameter, 'R_LM'); % Ratio of level
separation mismatch. Relevant when not PAM-2 (NRZ).
266 param.samples_per_ui = xls_parameter(parameter, 'M', 32); % Samples
per UI
267 param.ts_sample_adj_range = xls_parameter(parameter,
'sample_adjustment', true, [0 0]); %sample point adjustment range
...
265 + param.S_tn_w_AM = xls_parameter(parameter, 'S_tn_w_AM', false, 1); %
0/1, remove sigma_X2 if param.S_tn_w_AM = 0 else it's 1 and will use
sigma_X2
266 param.R_LM = xls_parameter(parameter, 'R_LM'); % Ratio of level
separation mismatch. Relevant when not PAM-2 (NRZ).
267 param.samples_per_ui = xls_parameter(parameter, 'M', 32); % Samples
per UI
268 param.ts_sample_adj_range = xls_parameter(parameter,
'sample_adjustment', true, [0 0]); %sample point adjustment range
...
```

* https://opensource.ieee.org/richard.mellitz/com_code/-/raw/S_tx_bug/release/com_ieee8023_4p13p0_S_tx_bug.m?ref_type=heads&inline=false

Summary

- ❑ 1 Keyword added: S_tn_w_AM
 - Default is false (1)
- ❑ Defaults aligns tx noise to d1.4+

Thank You!