

Summary of TDECQ Changes

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Addresses Comment: R2-190

Supporters

Clause 180.9.6 TDECQ Differs Substantially from Previous Versions

- Previous clauses relied on the methodology defined in Clause 121.8.5
- Clause 180.9.6 substantially rewrote Clause 121.8.5
 - The type of equalizer is different
 - DFE instead of FFE, with 1 feedback tap
 - The time domain of the equalizer is different
 - 180.9.6 uses a discrete-time equalizer
 - 121.8.5 uses an FFE that was ambiguously either discrete-time or continuous-time
 - Estimation of SER is substantially different
 - 121.8.5 uses discrete histograms, one for each sub-eye, and approximations to a Gaussian function
 - 180.9.6 uses ERFC functions for each point and knowledge of the transmitted symbol
 - Optimization is different
 - 121.8.5 says to find the best equalizer tap settings that minimize TDECQ
 - 180.9.6 explicitly gives an optimization criterion (MMSE) for fast convergence

Important to Differentiate Between TDECQ Methodologies

- Simply citing TDECQ is ambiguous at best and misleading at worst
- Some 400G presentations have remarked on the inadequacy of TDECQ as a metric, but they were relying on the Clause 121 version
- Comment R1-262 proposed renaming to TDECQ-D
 - Rejected due to precedent: Past equalizer updates did not change the TDECQ name.
 - Editorial burden: A universal name change would require sweeping updates throughout the standard
- Comment R2-190 proposes instead adding a note:

Note - Clause 180 TDECQ methodology differs substantially from TDECQ in previous clauses. When it is not clear from context, the TDECQ in this clause should be referred to as "Clause 180 TDECQ."

Thank you