



Jan 2024: P802.3dj Optics Introduction

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Main topics this week (and things to consider)

1) Baseline proposal for recently adopted 500m objective

- Suggest using 800GBASE-FR4-500 as nomenclature
- Proposed baseline is based on FECo consistent with justification of adding the new objective
- Outcome of November meeting was two categories of 800G optical IMDD PMDs
 - 500m – based on FECo for latency optimization concerns
 - 2km + - based on FECi for added link margin
- Optical automatic link configuration (brown_3dj_02_2401) to support implementation interop between FEC modes
- Counter-consideration:
 - Low latency proposal for Inner code FECi (he_3dj_01_2401) proposes new extra FEC mode and suggests applicability to the 2km PMDs but also 800G-FR4-500

Main topics this week (and things to consider)

2) Channel models for our SMF PMDs

- IEEE 802.3 has traditionally pointed to ITU fiber specs and created our own channel models for every clause based on deviations to those specs (see backup)
- IEEE 802.3 has traditionally been consistent between clauses on those SMF channels models and the deviations
- Long-term concern that following this approach is conservative and leaves too much margin
- Different approaches being consider for these deviations:
 - ITU have offered via liaison a CDq approach that offers some improvement through a simplified statistical approach
 - Contributions this week (rodes_02) suggest an alternative statistical approach that further improves the channel model
- For consideration:
 - Since every PMD clause defines its own channel model, it is possible to have a per PMD channel model. Taking this to the extreme this would be chaotic.
 - However, are we approaching a situation where we could consider different channel models for our PMDs – significant work needed to justify both the channel models and the application of these potential models to the specific PMD specs.
- ITU liaison response needed out of March meeting
- Also, a new fiber loss approach is proposed

Main topics this week (and things to consider)

3) Coherent technology baseline proposals

- Per [adopted timeline](#) it is imperative that we start adopting baselines asap to ensure continuation of the coherent work within the P802.3dj Task Force (vs spin out)
- The application of coherent technology into IEEE 802.3's scope of work is still in its infancy and we're still figuring out the market applications
 - Traditional telecom applications remain – but newer use case within it (eg. 5G backhaul)
 - New Intra-datacenter applications arising – aka “coherent-light” – to support AI/ML type cluster topologies
- P802.3dj has more proposed solutions than adopted objectives – creates tension around baseline adoption
- A joint proposal ([cheng_3dj_01_2401](#)) has been made as a way to resolve this with:
 - Proposed adoption of baselines for currently existing objectives
 - Proposed new objective to address the above market reality
 - With any new proposed objective, we need to assess any impact to existing CSD and PAR documentation. Initial review suggests no changes needed.
- A specific 800GBSAE-LR1 optical baseline ([maniloff_3dj_01_2401](#)) is also proposed

Note: a new aspect of coherent spec methodology is proposed ([kota_3dj_01_2401](#)). Proper Task Force scrutiny needed here so getting past baseline adoption asap is encouraged.

Backup

Example P802.3 channel specification methodology

151.11 Characteristics of the fiber optic cabling (channel)

The 400GBASE-FR4 and 400GBASE-LR4-6 fiber optic cabling shall meet the specifications defined in Table 151–13. The fiber optic cabling consists of one or more sections of fiber optic cable and any intermediate connections required to connect sections together.

151.11.1 Optical fiber cable

The optical fiber cable requirements are satisfied by cables containing ITU-T G.652.B (dispersion unshifted), type G.652.D (low water peak, dispersion unshifted), or type G.657.A1, or type G.657.A2 (bend insensitive) fibers, or the requirements in Table 151–14 where they differ.

Table 151–14—Optical fiber and cable characteristics

Description	Value	Unit
Nominal fiber specification wavelength	1310	nm
Cabled optical fiber attenuation (max)	0.47 ^a or 0.5 ^b	dB/km
Zero dispersion wavelength (λ_0)	$1300 \leq \lambda_0 \leq 1324$	nm
Dispersion slope (max) (S_0)	0.092	ps/nm ² km

^a The 0.47 dB/km at 1264.5 nm attenuation for optical fiber cables is derived from Appendix I of ITU-T G.695.

^b The 0.5 dB/km attenuation is provided for Outside Plant cable as defined in ANSI/TIA 568-C.3.