

Channel Link Model

Activity Report

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General information

- Chartered tasks
 - Update the existing Excel spreadsheet to reflect the 10G transmission channel impairments:examine:
 - last version accepted by EFM – available at:
http://ieee802.org/3/efm/public/tools/EFM0_0_2.7.xls
 - Spreadsheet aligned to 802.3ae D3.2, D3.3 available at:
 - http://ieee802.org/3/ae/public/adhoc/serial_pmd/documents/10GEPBud3_1_16a.xls
 - Include splitter loss in the overall channel loss figure
 - Account for downstream video overlay @ 1550 nm
 - Account for SBS and SRS due to analog signal transmission at high power levels

Activity report [1]

- Completed tasks
 - Include splitter loss in the overall channel loss figure
 - Current 10GEPON spreadsheet available at:
<http://www.ieee802.org/3/av/public/tools/10GEPON-D.0.3.xls> includes splitter loss in the power budget
 - Account for downstream video overlay @ 1550 nm
 - It was decided that the video overlay related channel impairments will be calculated in a separate spreadsheet maintained at:
http://www.ieee802.org/3/av/public/tools/10GEPON-NonLinearEffects_v1.1.xls (current version 1.1)
 - Video overlay is out of scope of IEEE 802.3 and should not be incorporated into generic Ethernet channel link spreadsheet

Activity report [2]

- Completed tasks

- Account for SBS and SRS due to analog signal transmission at high power levels

- SRS effect is implemented in both Excel

- http://www.ieee802.org/3/av/public/tools/10GEAPON-NonLinearEffects_v1.1.xls (current version 1.1) and Matlab

- http://www.ieee802.org/3/av/public/tools/SRS_power_penalty.m (current version 1.0)

- SRS makes sense only with digital signal located in 1520 – 1540 nm band
 - SRS for digital signal in 1580 – 1600 nm is undefined
 - depends on the video modulation scheme which is out of scope of IEEE 802.3
 - requires complex modeling which cannot be implemented in Excel spreadsheets even in simplified form

Activity report [3]

- Completed tasks
 - Account for SBS and SRS due to analog signal transmission at high power levels
 - SBS model still defies any attempts at its implementation (both in Excel and Matlab)
 - Initial results for simplified SBS model indicate that the expected value significantly underestimates the cross talk caused by the SBS effect in the channel
 - Numerical solution must be pursued \neq incompatible with Excel modeling
 - Bonus task:
 - Compared the new G.652 fibre attenuation figures with current Excel spreadsheet implemented values
 - Completely different – see Matlab implementation at:
<http://www.ieee802.org/3/av/public/tools/AttenuationG652.m>

Targets for the next 2 months

- Ad hoc tasks left open ...
 - SBS effect modeling
 - Attempt to implement the complete SBS model in Excel and discard the model simplifications
 - Compare the SBS modeling with real data measurement for 10G channels
 - Chromatic dispersion measurements
 - Resolve the issue of inconsistency of chromatic dispersion value between the Excel implemented model and the measurements
 - Is the model too simplified or the dispersion characteristics for the G.652 fibre changed with time ?
 - Analyze the issue and produce a report on the fibre dispersion parameter modeling employed in current Excel spreadsheet