100G Next Gen Optics MMF ad hoc meetings review

July 2012

Jonathan King, MMF ad hoc chair

MMF ad hoc activity since May 2012

- Discussion on the correct way to treat Mode Partition Noise (MPN) on the reflector and in two teleconference calls during June/July.

- Summary: Is MPN calculated correctly by the Ethernet spreadsheet model?
  - Contributions from Petar Pepeljugoski, David Cunningham, Robert Lingle and Kasyapa Balamarthy
  - Some agreement that MPN penalty should be calculated differently, but no consensus on how the spreadsheet should change yet.
    - Could involve change of equations and/or change in k value in spreadsheet
  - Contributions from Petar Pepeljugoski show dynamic behavior of MPN s.d. (changes within bit period); and, with David Cunningham, MPN can be affected by adjacent bits in ISI cases.
    - The spreadsheet calculates MPN for a 1010 pattern, which is not worst case (especially when ISI is significant)
    - David's work with Petar has also shown that scaling σ_{MPN} calculated by the spreadsheet model by P_{ISI} matches exact simulation results.
    - Petar's statistical link simulations show MPN SD is lower for majority of links
    - Discussion over whether the values for MPN penalty can be significantly bigger than the spreadsheet calculations – if they were, more real links would be broken by MPN penalty.
  - Agreement that more work is required !

Presentations on MPN since May

- Petar Pepeljugoski "Dynamic Behavior of Mode Partition Noise in MMF"

- David Cunningham & Petar Pepeljugoski "Summary of MPN Calculations Jointly Investigated"

- Petar Pepeljugoski "Correctness of calculation of MPN penalty in SM model"

- Kasyapa Balemarthy & Robert Lingle "Mode Partition Noise Modeling"

- Meeting notes and presented materials will be available on the 100G Next Gen Optics website: http://www.ieee802.org/3/100GNGOPTX/public/mmfadhoc

Thanks !