100M Ad Hoc Group

Progress report

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Outline

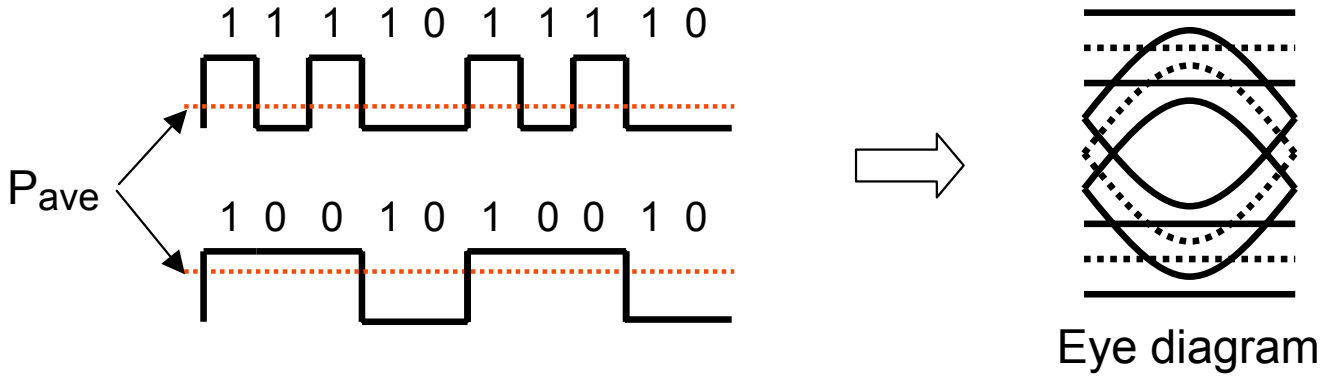
- 100M dual SMF
  - Eye pattern mask
  - Test pattern
  - Testing conditions relative to AC coupling
  - Jitter methodology
- 100M single SMF
  - Translation of TTC, TS-1000, to English
- Related presentations

The Baseline Wander Problem

- Unbalanced 4B/5B NRZI code
  - Ratio of 0s to 1s is between 4:6 and 6:4
- 100BASE-FX does not scramble the data
  - Neither before nor after 4B/5B encoding

⇨ Baseline wander

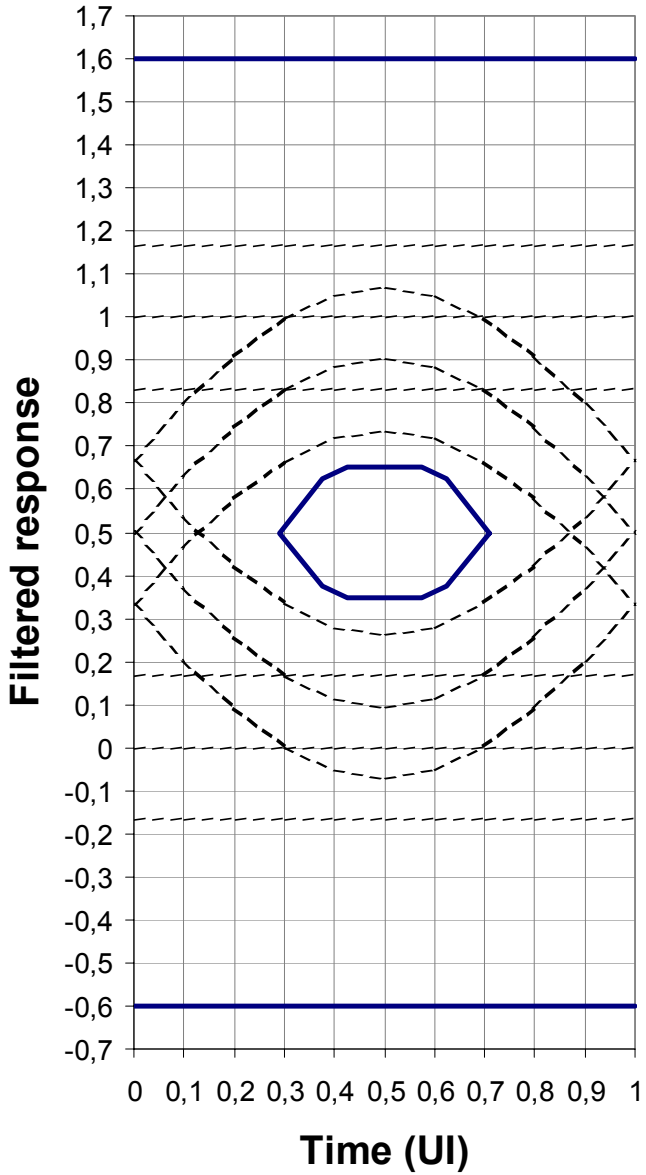
  - Gives tight vertical eye closure
  - Costs a significant penalty (~2dB)
  - A few “nasty” packets will have higher error probability than others



Eye diagram

Draft Proposed Eye Mask

- Details found in *dawe_1_0702*
- Captures existing transceivers and allows for new low-cost transceivers
- Tolerates the baseline wander
- Assumes reasonably modern silicon with fast gates
  - Mask length depends on what timing window the CDR or SERDES needs



Test Pattern Considerations

- Test the eye using unbalanced “worst case” test pattern

- Component suppliers need bit level test
- Box-level suppliers need system level test

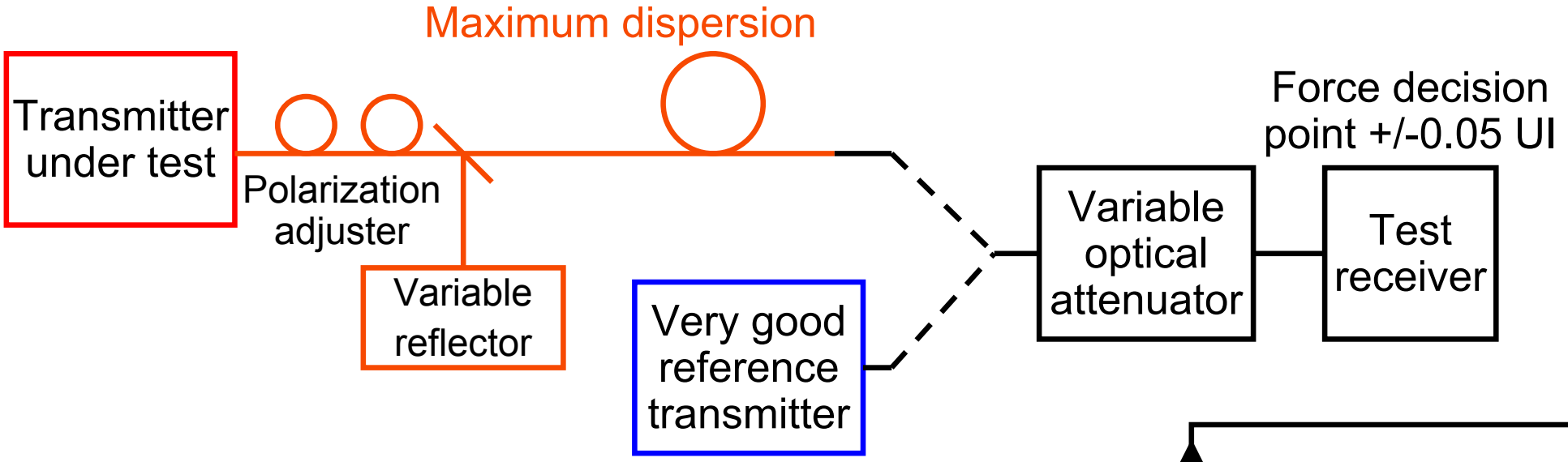
- Possible to allow both tests!
  - Proposal by Jerry Radcliffe (*radcliffe_1_0702*)
  - Define fixed bit level pattern which forms a series of legal Ethernet frames.
  - Use same pattern for system level test where the source and destination MAC addresses may vary

Test Conditions Relative to AC Coupling

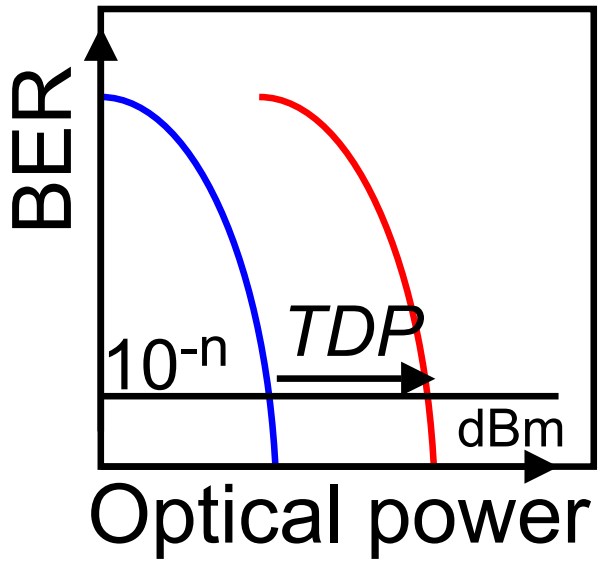
- Oscilloscopes are DC coupled
  - Eye mask measurement should be DC coupled
- Problem: Possible to remove the baseline wander effect by having a long enough AC coupling time constant
- Solution: Use TDP measurement (see next slide)
  - Used in 802.3ae
  - Use together with unbalanced “worst-case” test pattern
  - Could use appropriate high pass filter in TDP reference receiver
- Other alternative solutions also possible
  - Define two eye masks (both balanced and unbalanced)
  - Measure AC coupled with time constant significantly shorter than worst case test pattern

TDP: Transmitter and Dispersion Penalty

- Test a transmitter by substitution against a very good one

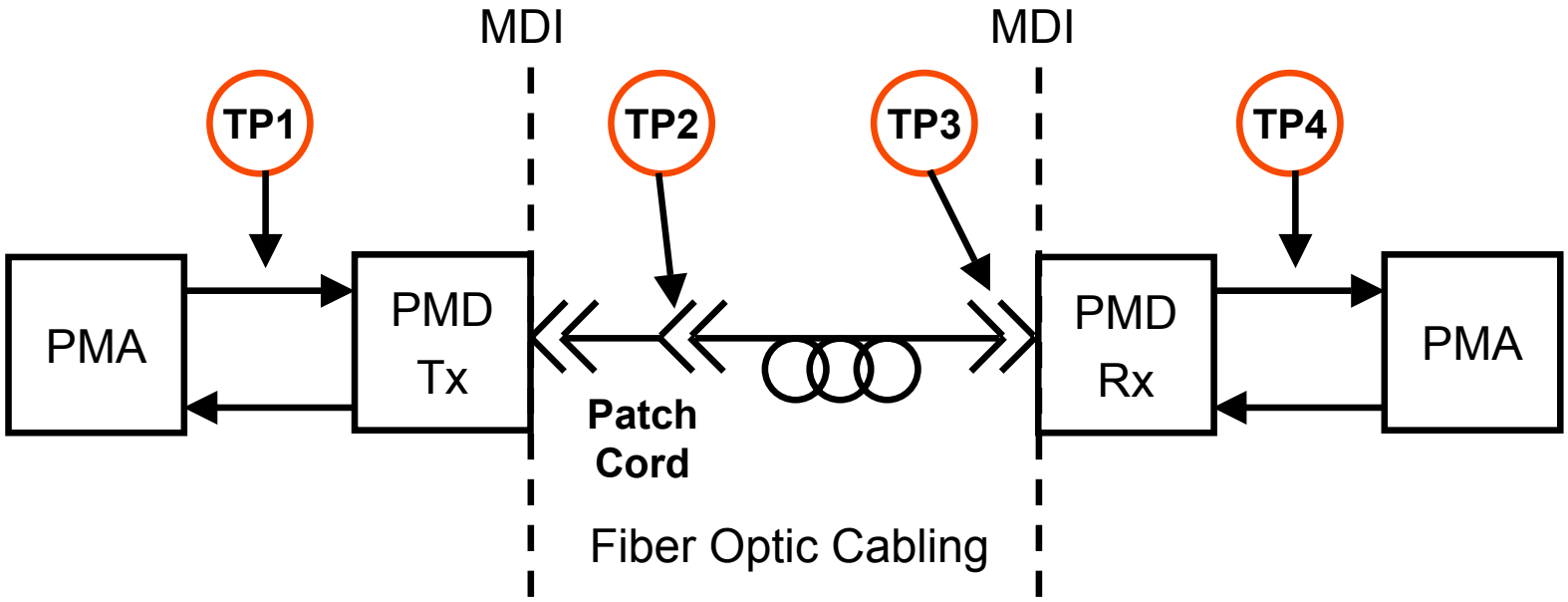


- Screens for total of most relevant effects
  - high probability e.g. ISI, jitter “W”
  - low probability e.g. RIN, BLW, jitter “sigma”



Jitter Methodology

- Similar to 1000BASE-LX
- Specify all four test points, TP1 to TP4
  - TP2 important for TRx compliance
  - TP3 is similar to TP2 since operation over SMF without much dispersion
  - TP1 and TP4 allows for pluggable transceivers
- Values TBD (Piers Dawe is working on this)



100M single SMF

- K. Seto has translated the TTC, TS-1000, to English
  - See *seto_1_0702*

- Open issue:
  - Test pattern not specified

Related Presentations

- Presentations related to 100M ad hoc group work:
  - “Eye mask for 100 Mb/s”, Piers Dawe (dawe_1_0702)
  - “Proposal for Base Line Wander test Pattern for 100BASE-FX(SMF)”, Jerry Radcliffe (radcliffe_1_0702)
  - “TTC TS-1000 Class S Spec”, K. Seto (seto_1_0702)