Comment 86: 802.3aq LRM Draft 3.0

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802.3aq LRM interim meeting

Phoenix January 12, 2006

Summary of Recommendation

Redo PIE-D and finite equalizer analysis with center launch using a conservative MPD.

This is motivated by the fact that the OM1 and OM2 fibers are not characterized except for OFL BW and it is prudent to be conservative.

Simplest way to take current results is to not use 0um and 1um offset results, and re-do percentages without these offsets.

Comment -- Remedy

COMMENT: “Quasi-Static” Dynamic Response: A second type of dynamic response identified by the 802.3aq LRM task force and documented in presentations and previous comments is the quasi-static variation caused by touching or twisting or adjusting the fiber and/or connector. The modeling used to estimate the modal power distribution for near-center launches does not include this effect, nor does it agree with actual measurements presented by Corning, OFS, or Big Bear Networks. The resulting analysis gives an optimistic estimate of possible problems with OM1 and OM2 fiber

REMEDY: The estimated failure rate in simulations with near-center launch needs to include a more realistic MPD consistent with worst case MPDs seen as the connector is twisted. In order to keep the supported length at 220m, this will require changing the “stressor” or tap weights in Table 68-5 for the receiver and in the TWDP code for the transmitter. This work should be done rigorously to the satisfaction of the task force. The proposed change is to shift the three indicated stressors each one “place” further down the table previously calculated by J. Ewen.

– Remedy-detail

1. **Precursor Ewen10 → Ewen11.**

   PIE-D 3.82 → PIE-D 3.72; (12,5) 4.12→(12,5) 4.25

2. **Postcursor Ewen15 → Ewen16.**

   PIE-D 4.20 → PIE-D 4.26; (12,5) 4.34→(12,5) 4.41

3. **Split-Symmetric Ewen5 → Ewen6**

   PIE-D 3.83 → PIE-D 3.82; (12,5) 4.20→(12,5) 4.26

This remedy represents the minimum non-zero change to the stressors using the existing table.

References

802.3aq LRM presentations

king_2_1104.pdf slide 10 quasi-static example

balemarthy_1_0105.pdf slide 9

abbott_1_0305.pdf slide 12-13

abbott_2_0305.pdf slide 21

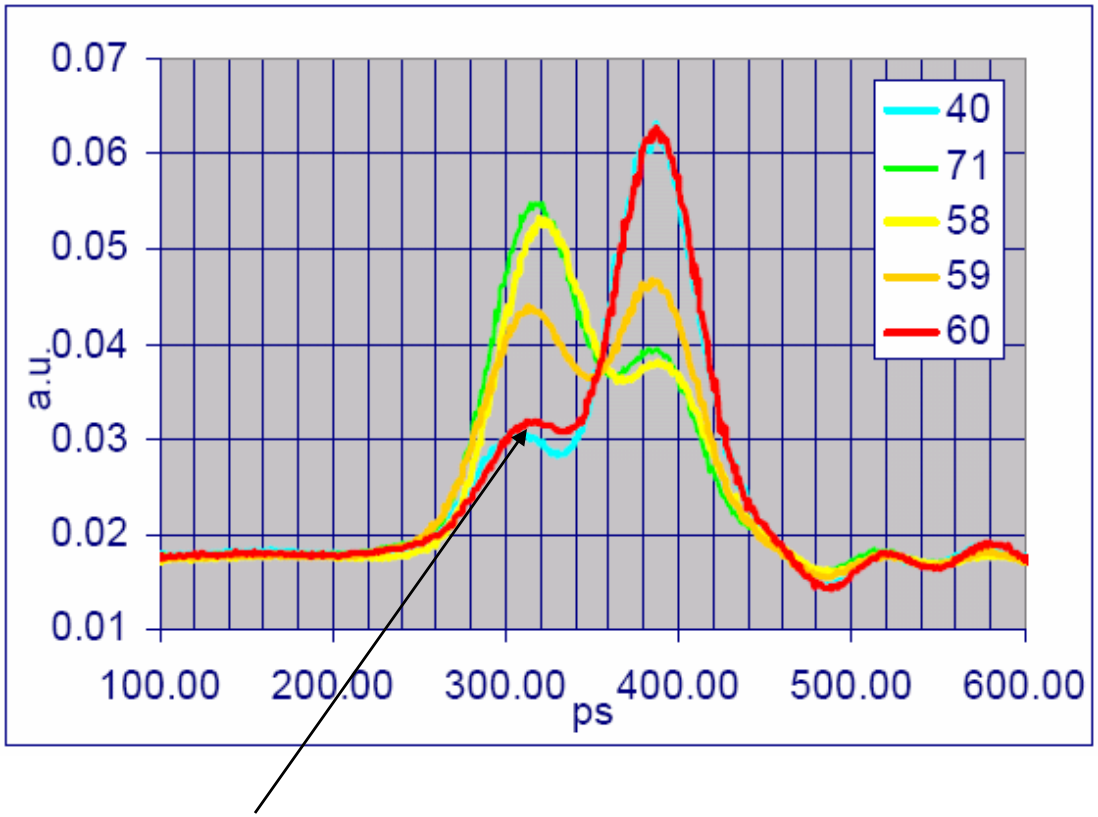
It is generally accepted that split pulses do occur at the center. The assertion here is that the modeling needs to better estimate the effect.

Summary of issue

In modeling near center launches, the 0um and 1um offset launches give "infinite" bandwidth, and are never seen in practice. See next page from abbott_2_0305.pdf. The theoretical BWs for 0um and 1um are the vertical lines at 9000MHz.km+ (max value)

The modeling with Gen67YY includes an equal weighting of 0-1-2-3um offsets. It would be better to just use 2-3um and modify the MPD for 0 & 1 um. The suggested adjustment is a more equal split pulse between groups 1 and 3 (which have the main power for near-center launch).

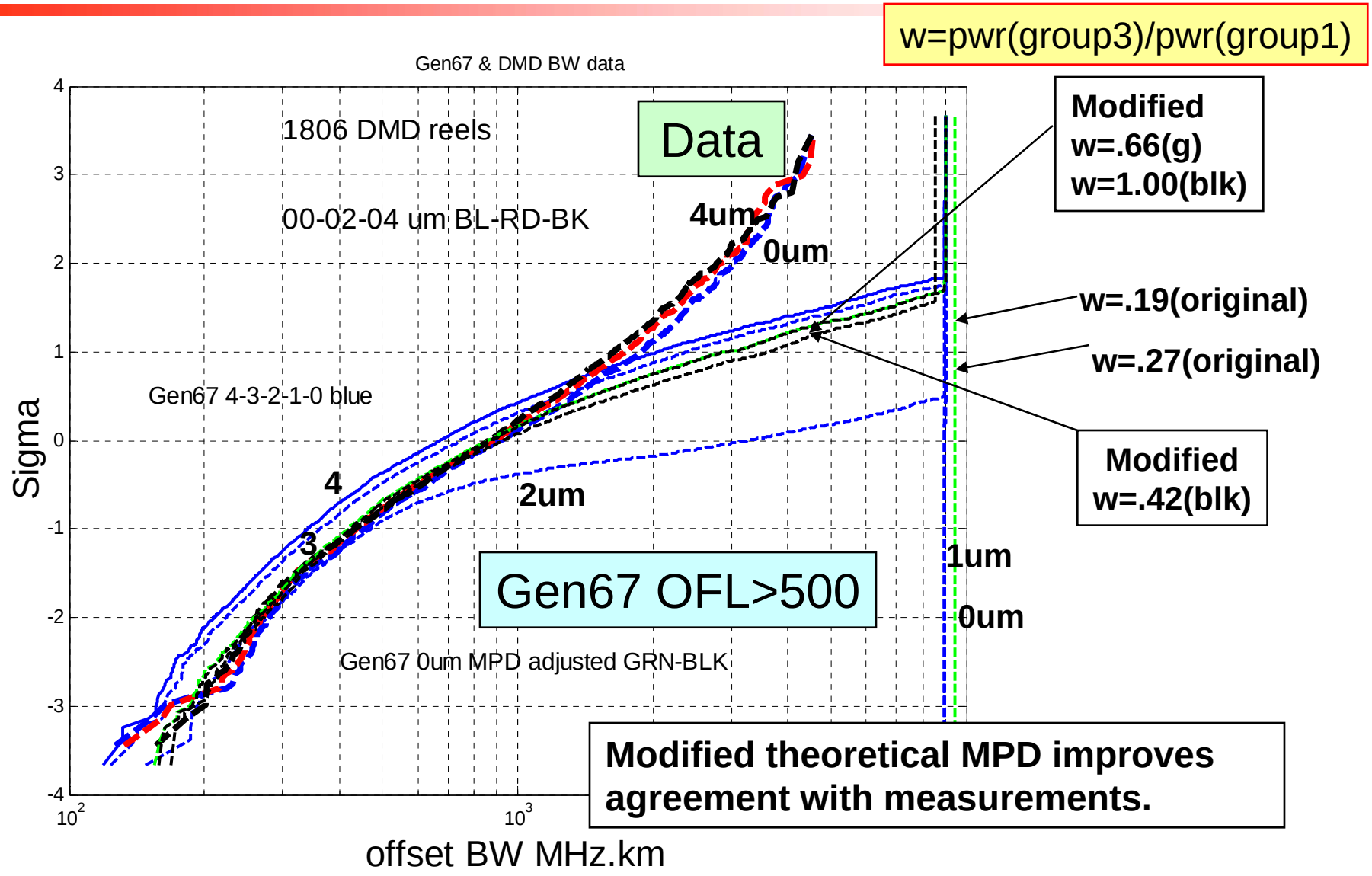
Split pulse (king_2_1104.pdf



Corning experience is that we don't see the "infinite bandwidth" with 0um-1um launch with fibers with pulse splitting which is noticeable with 4um offset.

Recommendation is to use MPD in modeling which includes a split pulse ratio of ~ .40 (.4 - .6 – 1.00 give about same EMB)

Offset BW distributions for 0-4um offsets



Recommendation

Redo PIE-D and finite equalizer analysis with center launch using this conservative MPD.

This is further motivated by the fact that the OM1 and OM2 fibers are not characterized except for OFL BW and it is prudent to be conservative.

<u>Simplest way to take current results is to not use 0um and 1um offset results, and re-do percentages without these offsets.</u>