TP3 Stress Test – IPR selection

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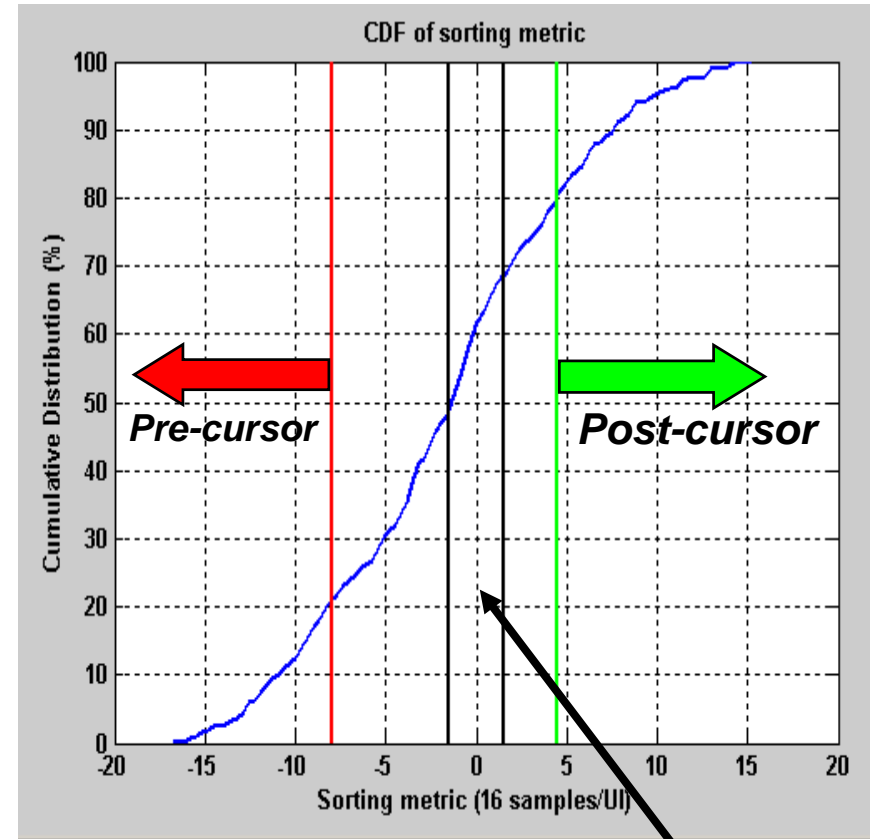## Big Bear Networks

Model Details

- Shape of the impulse response will stress real EDC implementations differently
  - Table 68-4 in D1.0 requires 3 TP3 tests; Pre-Cursor, Symmetric and Post-Cursor
- Automated method to sort IPR's into the 3 categories is proposed
  - IPR's are based on adopted channel models
- Simulated Fiber Model details
  - 300m of Monte-Carlo fiber model (Gen54YY)
  - 2 connectors with random offsets,
    - Rayleigh distributed, mean = 3.58 µm, truncated at 7 µm
  - Standard Offset Launch 17-23 µm
    - 1000 trials per offset
- 2 Channel Metrics were used to select worst case IPR's
  - PIE-D range of 4.75 ± 0.25dB
  - Passes LX4 specification
    - 3.6dB of ISI penalty (see ewen_1_1104)
  - 355 fibers passed the above criterion

Details of Sorting Algorithm

- Sorting Algorithm
  - Compare "center of gravity" with largest peak
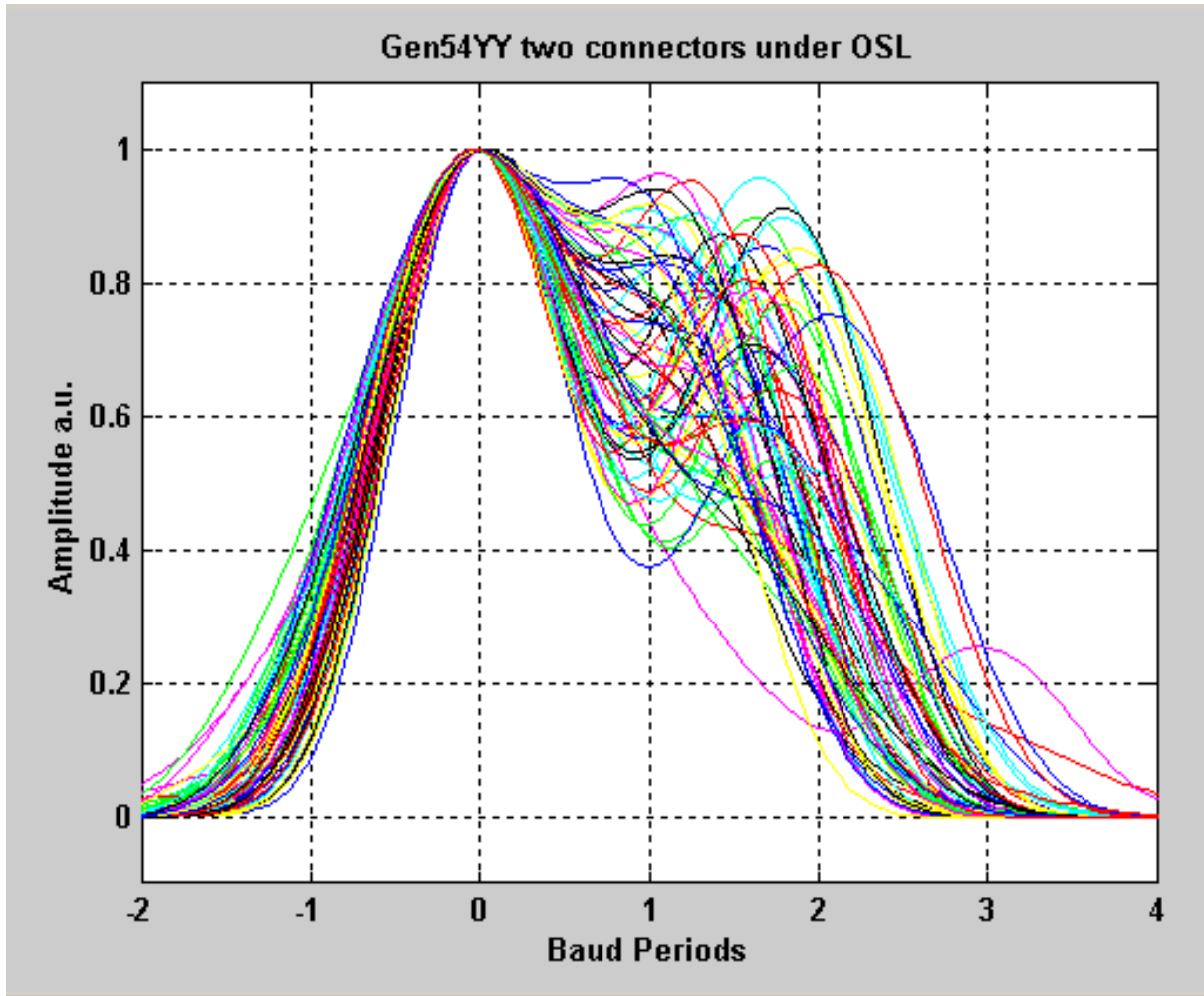- DC group delay is a measure of the "center of gravity"

$$CG = \frac{\sum_{k} k.h(k)}{\sum_{k} h(k)}$$

- In cases of multiple peaks, average peak location is used
  - 3% tolerance is used to determine location of main peak
- Sorting metric is DC group delay minus location of main peak
- CDF of sorting metric is used to bin pulses
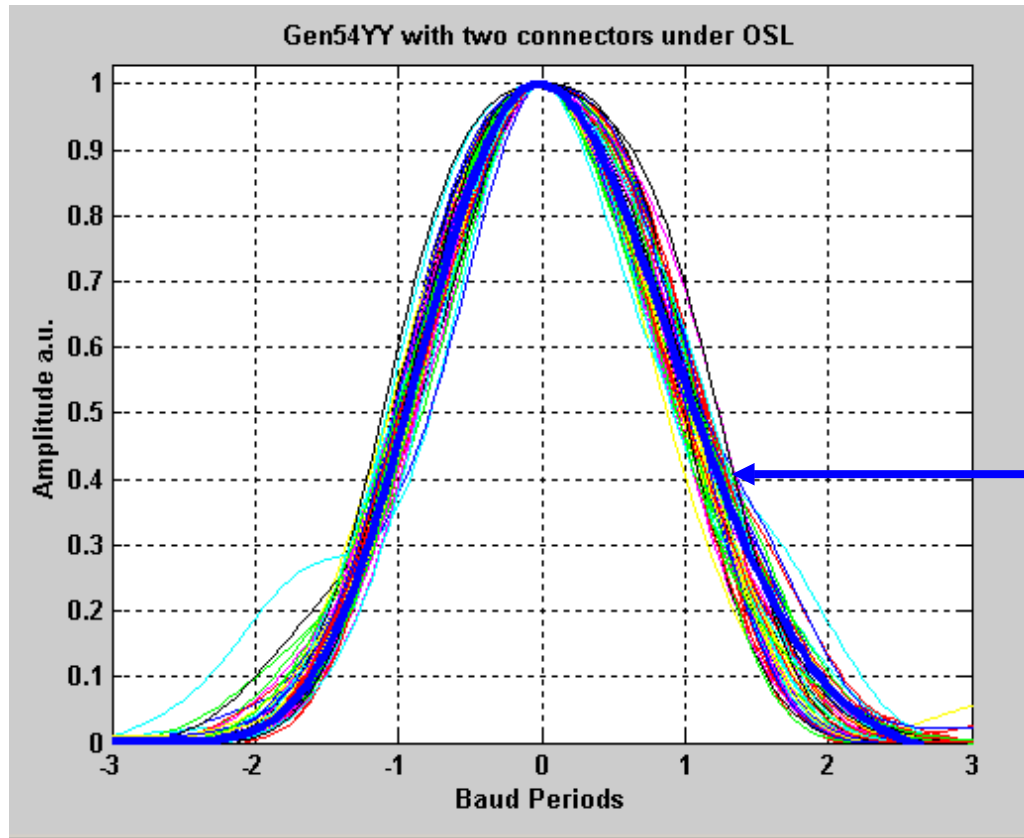 - ~20% of IPR's are retained in each of the 3 categories

CDF of sorting metric

Pre-cursor   *Post-cursor*

Symmetric

Post-Cursor

Gen54YY two connectors under OSL

- 72/355 are classified as post-cursor
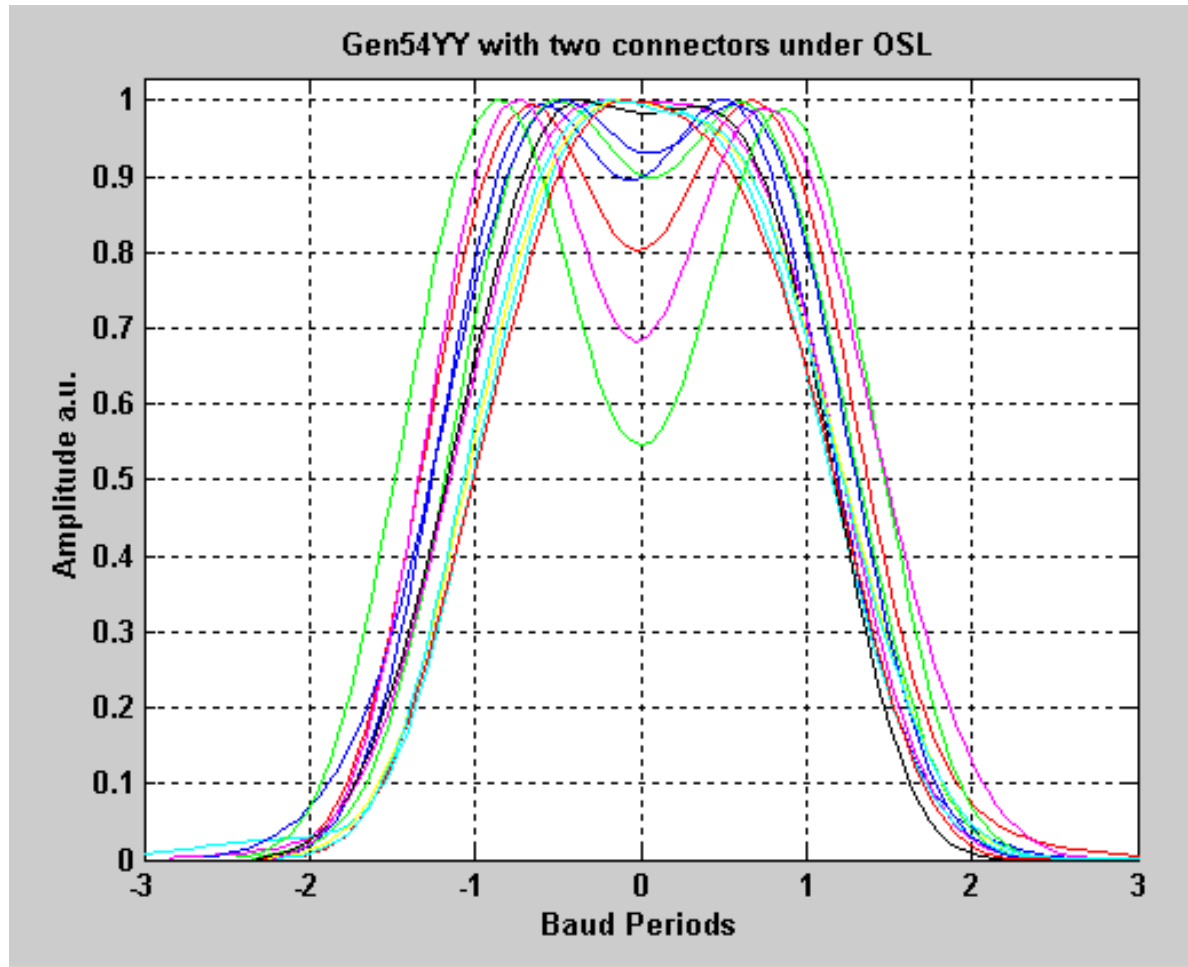
Symmetric I – Broad Pulses

Gen54YY with two connectors under OSL
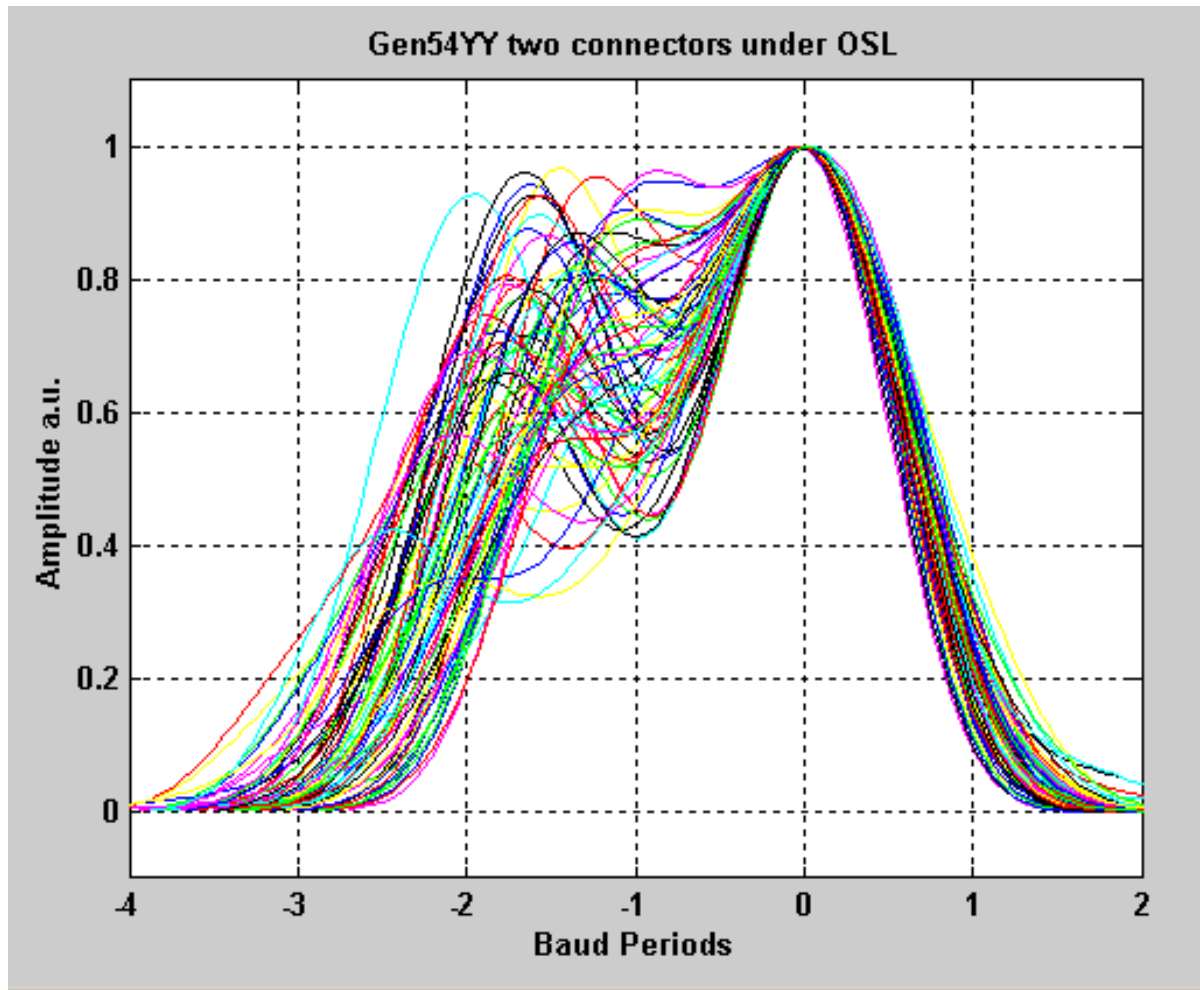
2GHz BT4

- 59/355 are classified as broad symmetric pulses
- 2GHz Bessel Thompson filter provides a good fit
- Already tested by TP3 simple stressed sensitivity test
  - Should we test for this again in comprehensive TP3 tests?

Symmetric II – Split Pulses

Gen54YY with two connectors under OSL

- 12/355 are classified as split symmetric pulses
- Recommend using this group for symmetrical pulses

Pre-Cursor

Gen54YY two connectors under OSL

- 73/355 are classified as pre-cursor

Summary

- Gen54YY with 2 connectors was used to generate worst case IPR's

- PIE-D of 4.75 ± 0.25dB was used as the channel metric
  - Pulses also pass LX4 specs

- Algorithm to sort these worst case IPR's into symmetrical, pre-cursor & post-cursor was described

- Symmetrical pulses were divided into 2 categories; split pulses and broad pulses
  - TP3 simple stressed Rx test accounts for broad pulses

- Recommend using split pulses for the symmetrical TP3 comprehensive test

- Need to choose one IPR from each category to complete TP3 comprehensive test