Effect of 1355nm source on LRM length/PIE-D/%failure tradeoffs

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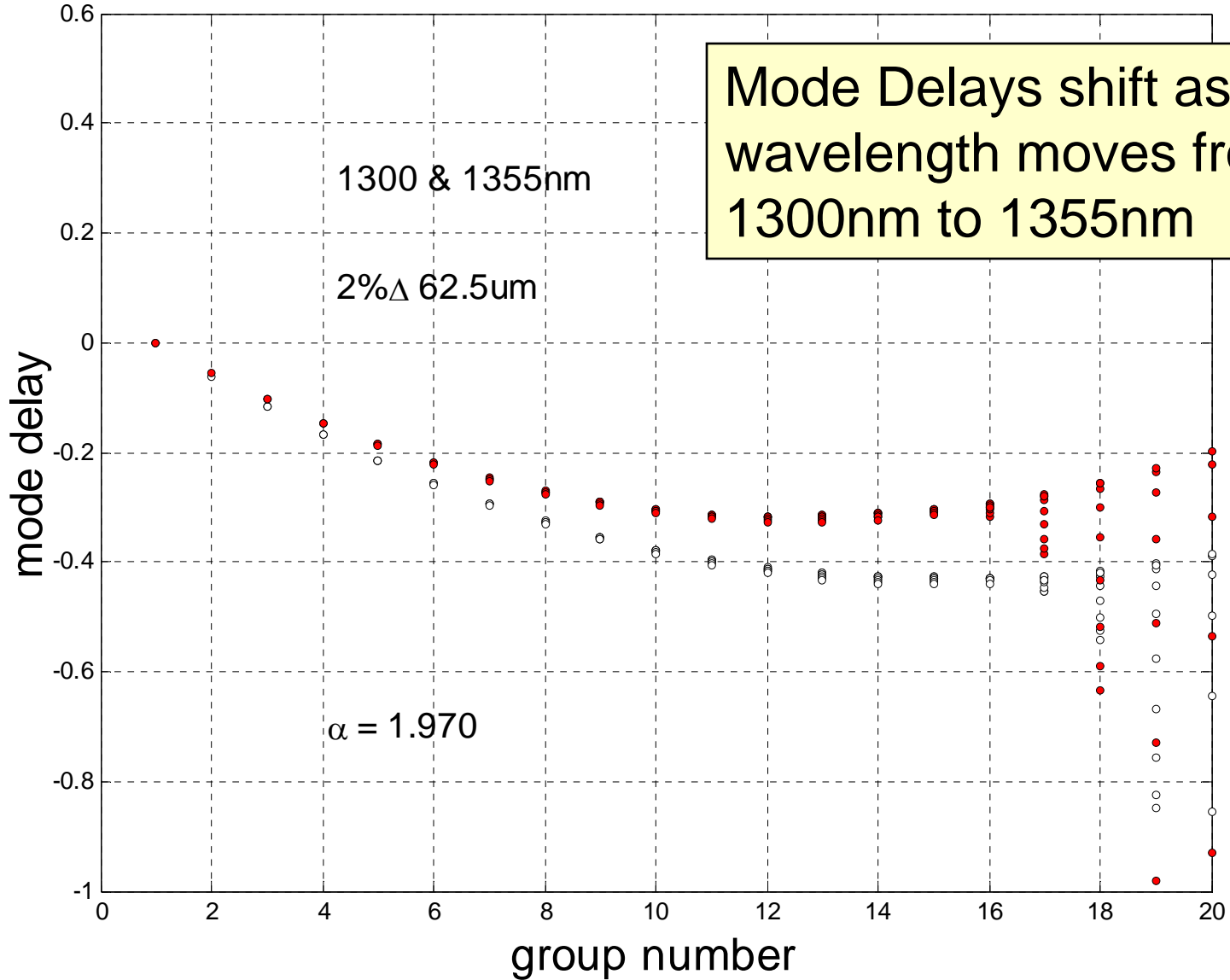CORNING
Discovering Beyond Imagination

Summary

There is an additional EDC penalty which needs to be considered, to account the spectral range of 1300nm lasers going as high as 1355nm.

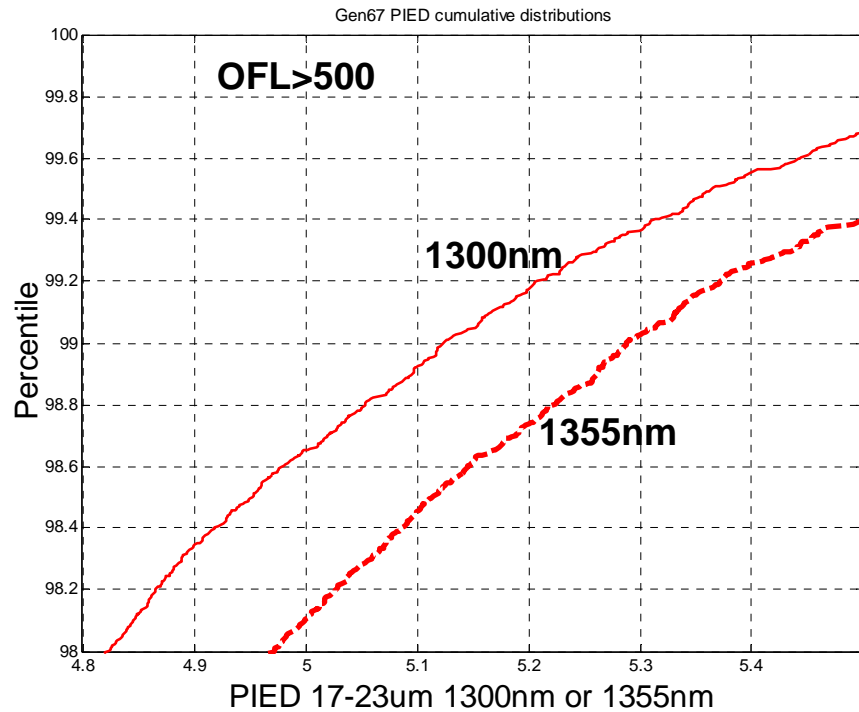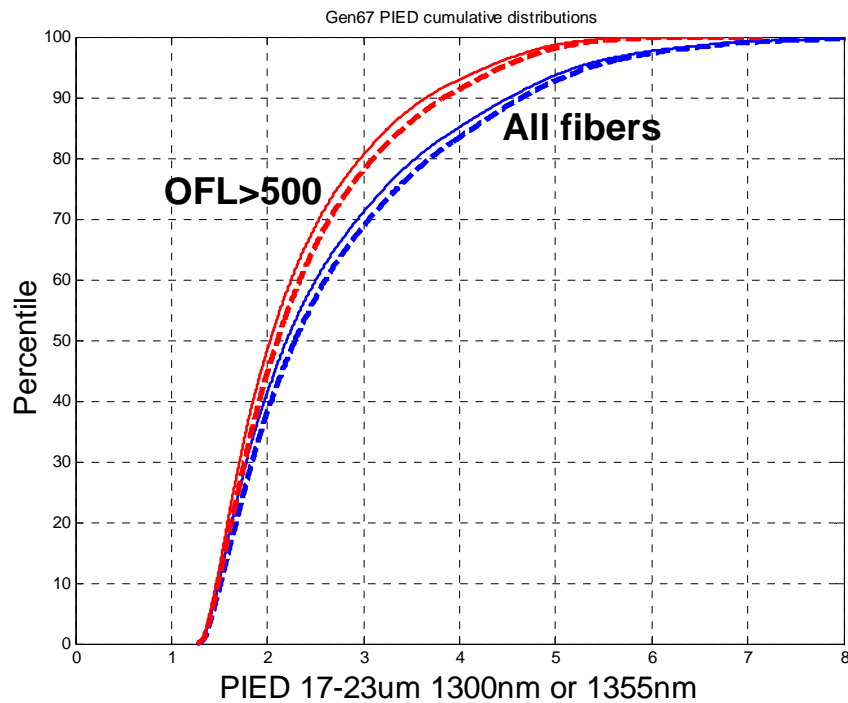At 1355nm the typical intermodal dispersion increases compared to 1300nm.

The effect is linear with mode group number and the value at group 18 is about 0.18-19nsec/km for a profile with an alpha of 2.000 and about 0.16-17nsec/km for a profile with an alpha of 1.970

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Mode Delays at 1300 & 1355nm alpha=1.970

Mode Delays FDDI 1300&1355

1300 & 1355nm

2%Δ 62.5um

$\alpha = 1.970$

Mode Delays shift as wavelength moves from 1300nm to 1355nm

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Gen67 cumulative PIE-D distribution 1300/1355

Gen67 PIED cumulative distributions
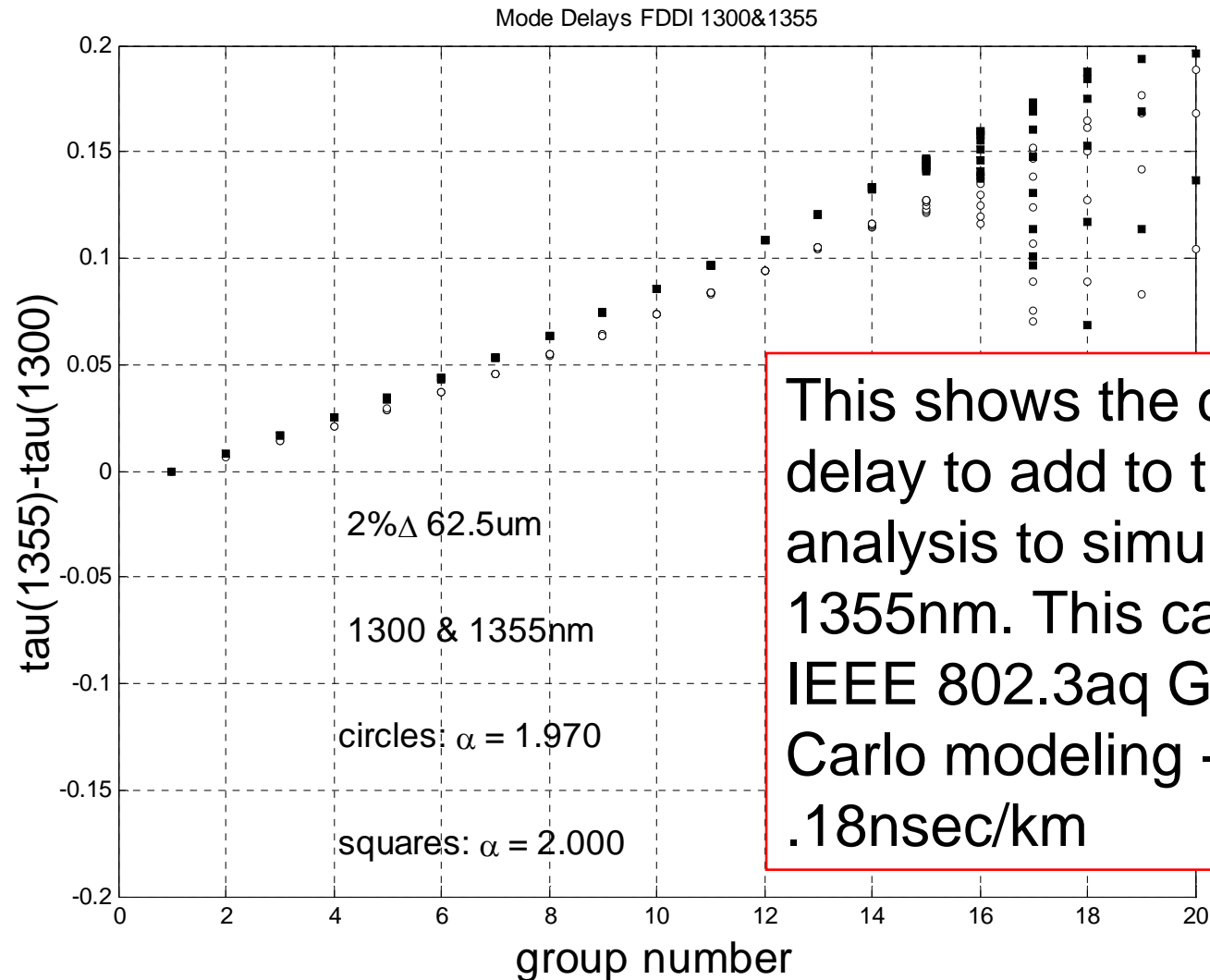
Gen67 PIED cumulative distributions

Calculating the "offset" PIE-D for the range 17-23um shifts the 99%tile PIE-D value by ~.1-.2dB

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BACKUP SLIDES

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Mode Delays at 1300 & 1355nm alpha=1.970 & 2.000
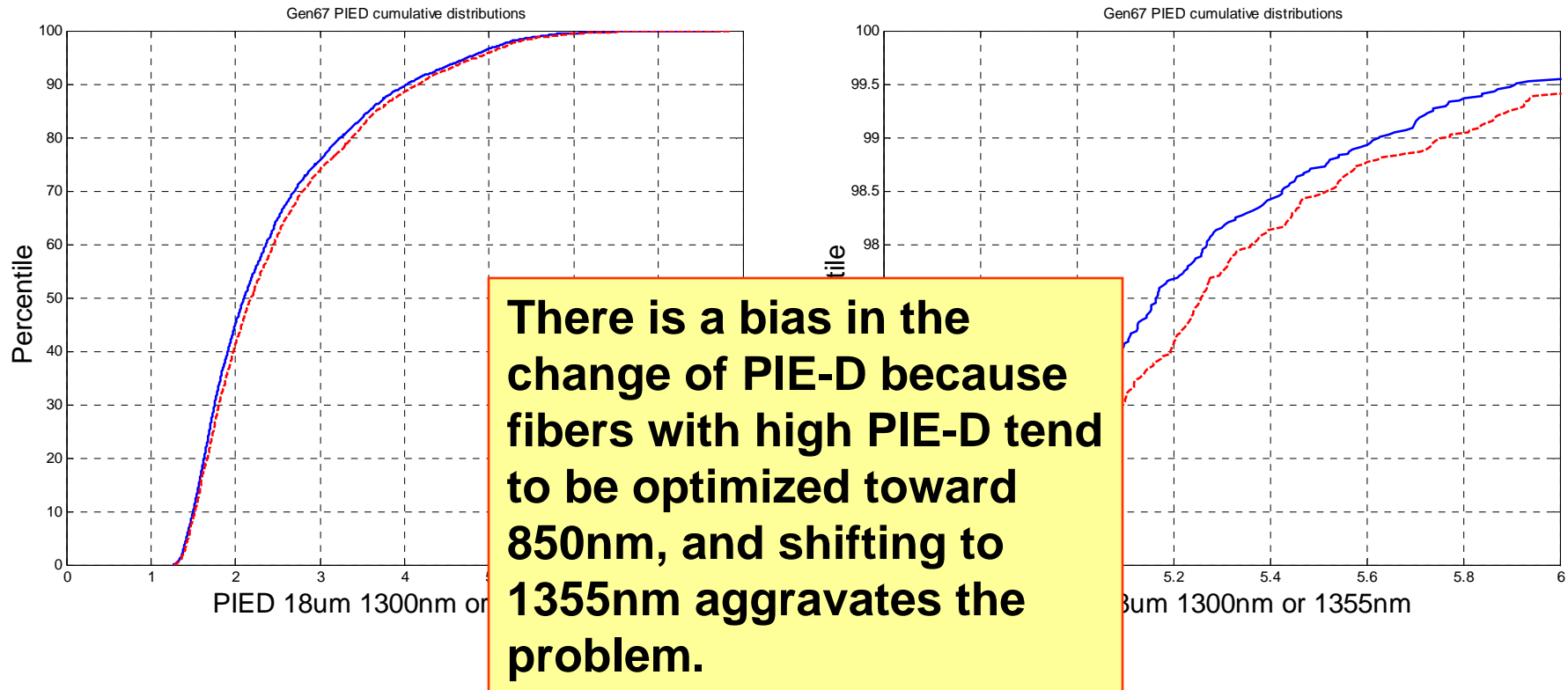

Mode Delays FDDI 1300&1355

This shows the change in mode delay to add to the 1300nm analysis to simulate delays at 1355nm. This can be done in the IEEE 802.3aq Gen67 Monte Carlo modeling --- about .18nsec/km
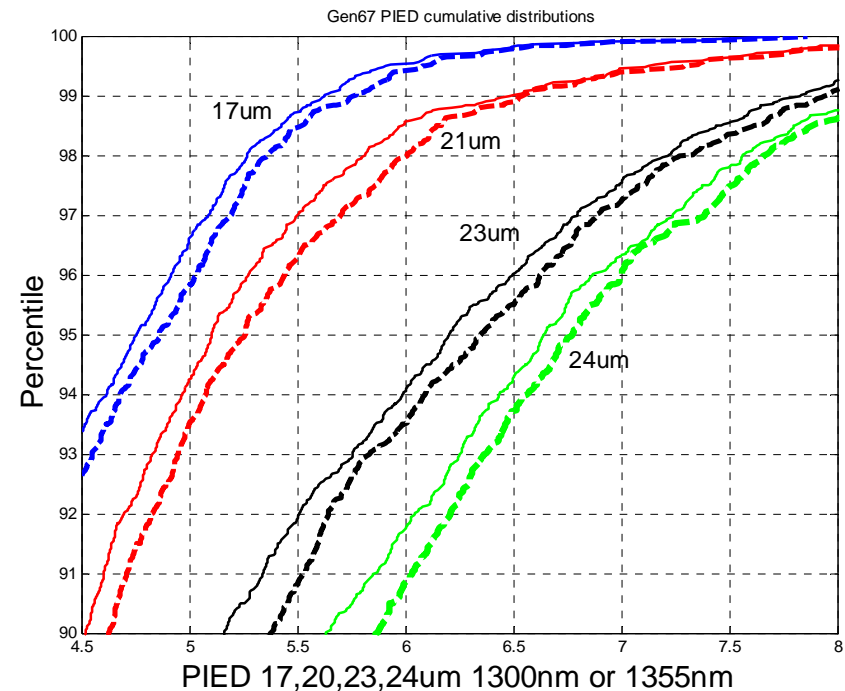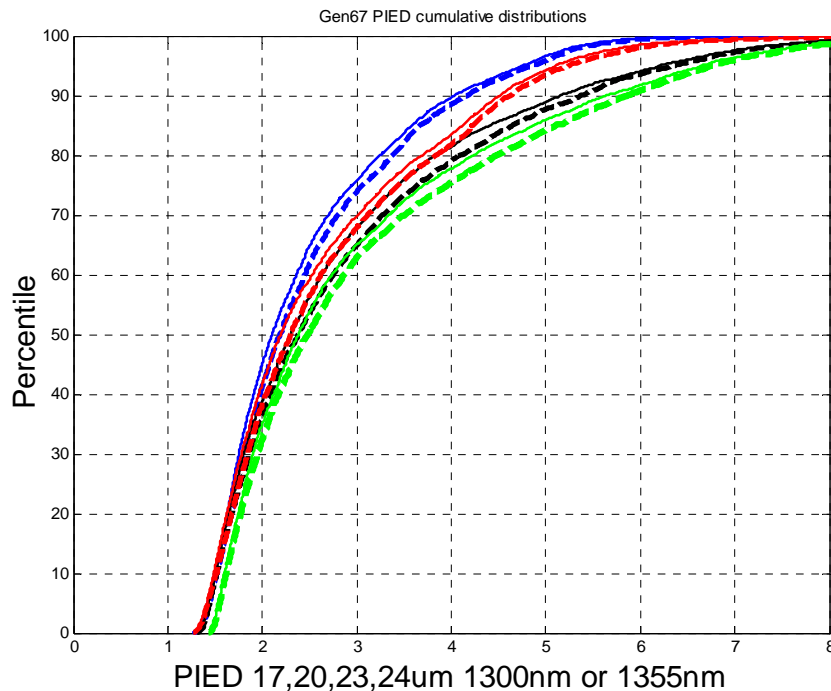
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PIE-D 1355nm vs PIE-D 1300nm

Gen67 PIE-D 1300&1355nm
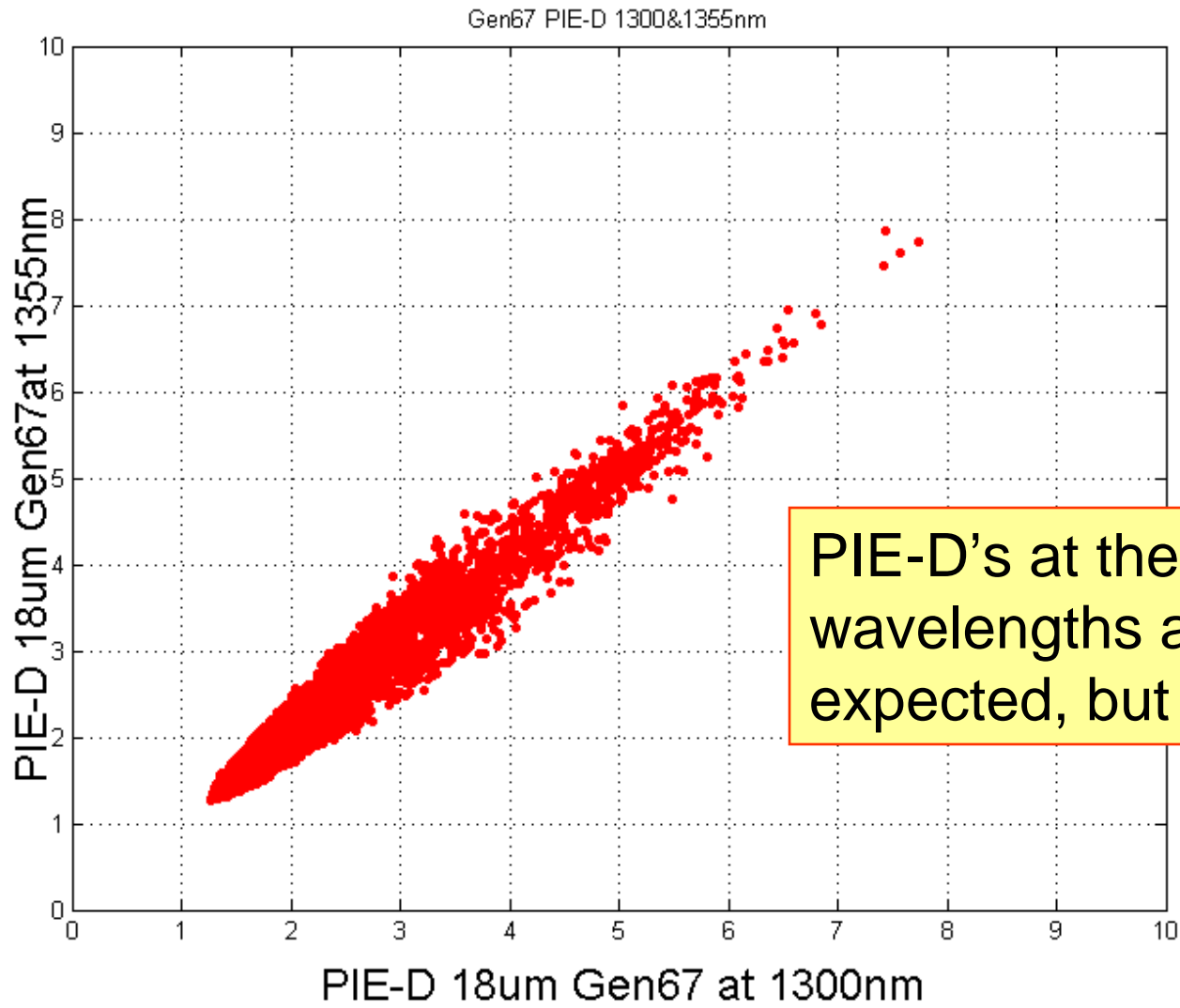
PIE-D's at the two wavelengths are similar, as expected, but not identical.

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Gen67 cumulative PIE-D distribution 1300/1355

Gen67 PIED cumulative distributions

There is a bias in the change of PIE-D because fibers with high PIE-D tend to be optimized toward 850nm, and shifting to 1355nm aggravates the problem.

PIE-D curve for 1355nm lies about 0.1dB higher than that for 1300nm – need to add an extra 0.1dB margin.

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Gen67 cumulative PIE-D distribution 1300/1355

Gen67 PIED cumulative distributions

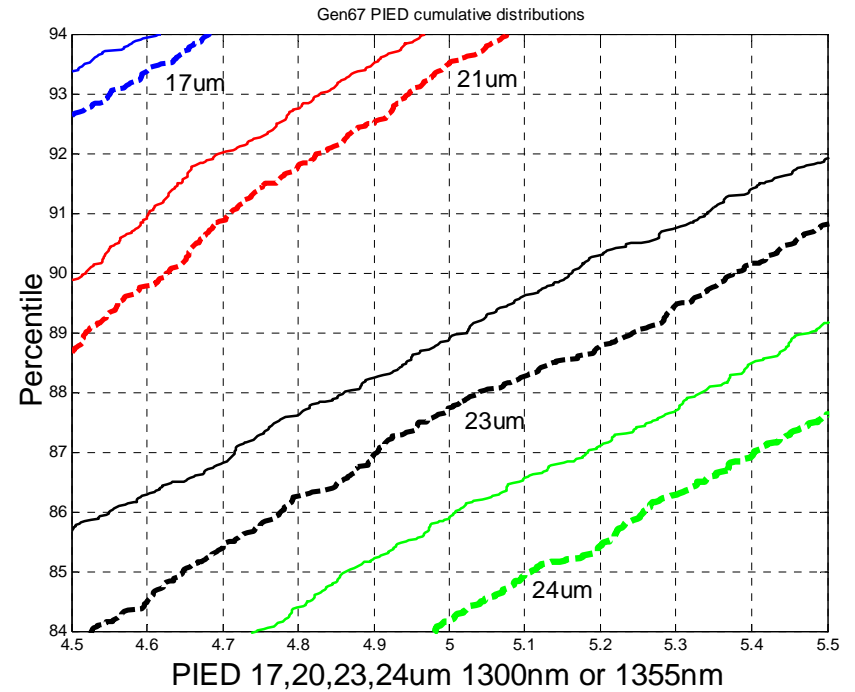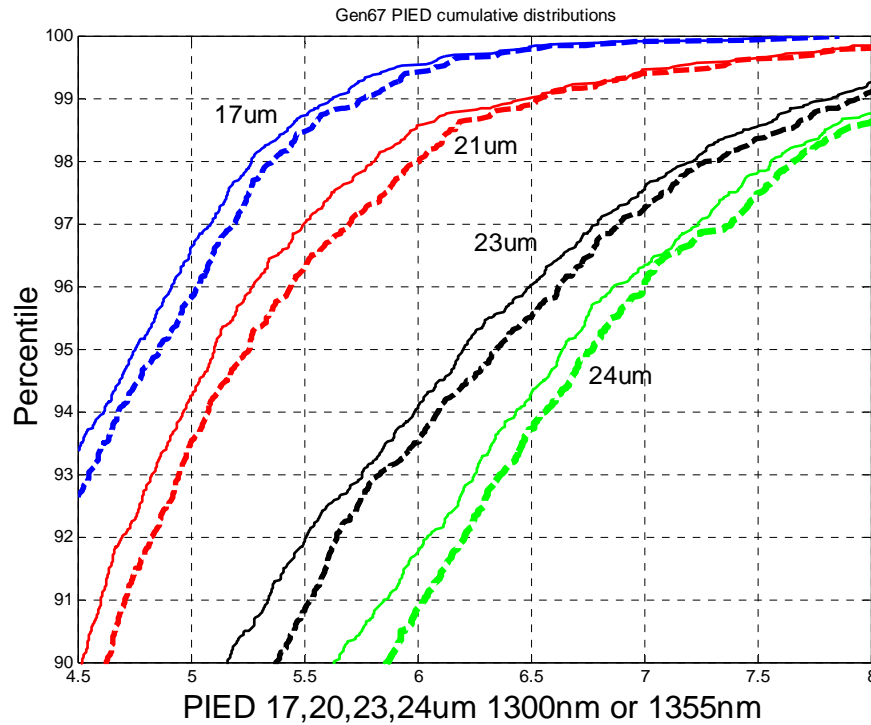PIED 17,20,23,24um 1300nm or 1355nm

Gen67 PIED cumulative distributions

PIED 17,20,23,24um 1300nm or 1355nm

PIE-D curve for 1355nm lies about 0.1dB higher than that for 1300nm – need to add an extra 0.1dB margin.

Or, % with PIE_D of 5dB or higher increases by about 1%

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Gen67 cumulative PIE-D distribution 1300/1355

Gen67 PIED cumulative distributions

PIED 17,20,23,24um 1300nm or 1355nm

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