200 GBASE-BR baseline proposal

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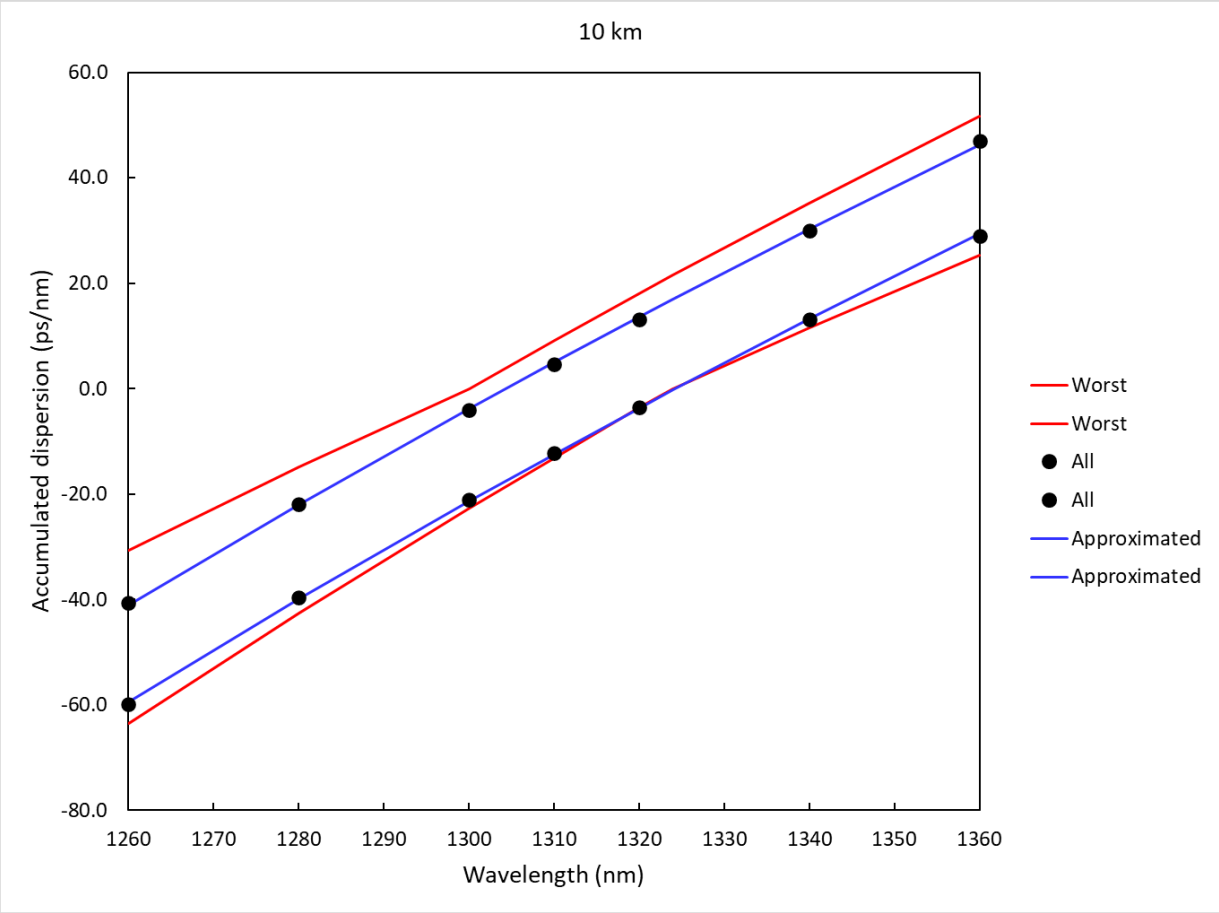
Main strategy to reach 200 Gb/s

- The 100 Gb/s links are using the 800 GHz channels at 1304.5 and 1309 nm
- We need to locate two more channels
- Staying on the 800 GHz grid, the likely suspects are 1300 and 1313.5 nm (actually, the minimum wavelength is 1299, and the max is 1314.5 nm)

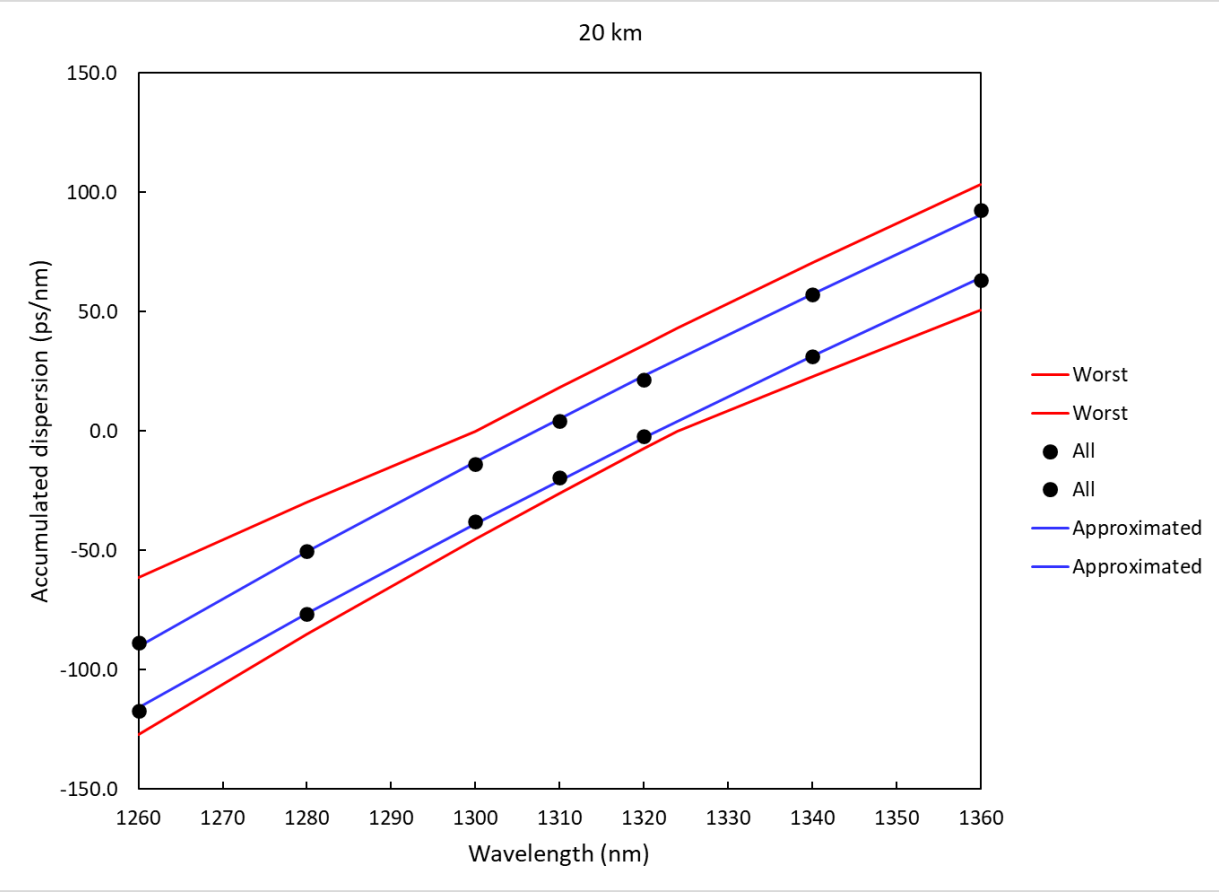
- Note that these are not the usual LANWDM wavelengths, but they follow the dispersion characteristics of the actual G.652 fiber
  - Going into the future, bend insensitive fibers have more negative dispersion

10 km CD limits for 99.99% confidence



1299 nm min CD = -22.2 ps/nm
1314.5 nm max CD = 8.3 ps/nm

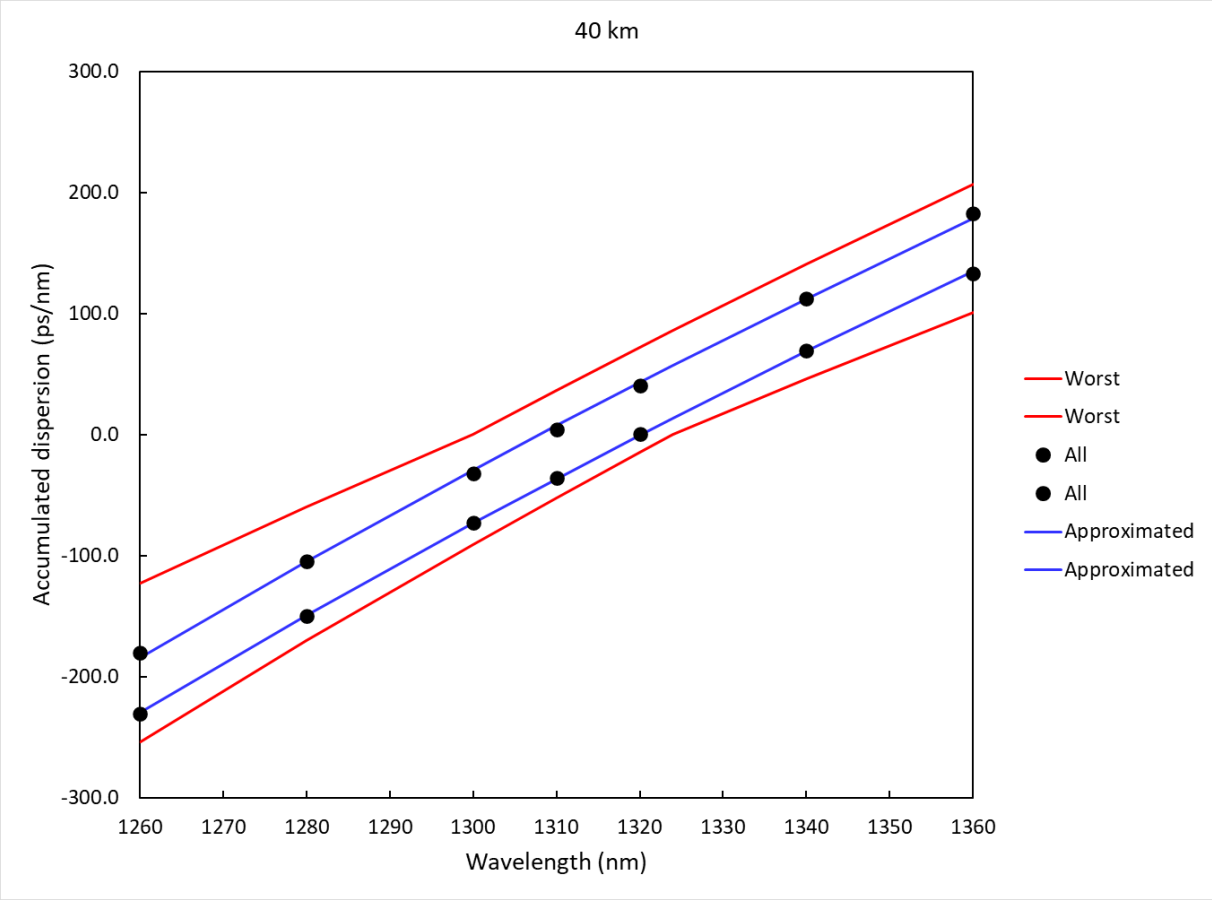
20 km CD limits for 99.99% confidence



1299 nm min CD = -42.23 ps/nm

1314.5 nm max CD = 14.75 ps/nm

40 km CD limits for 99.99% confidence



1299 nm min CD = -78.3 ps/nm
1314.5 nm max CD = 22.45 ps/nm

-60 ps/nm = 1304 nm
+30 ps/nm = 1316.5 nm

What about BR40?

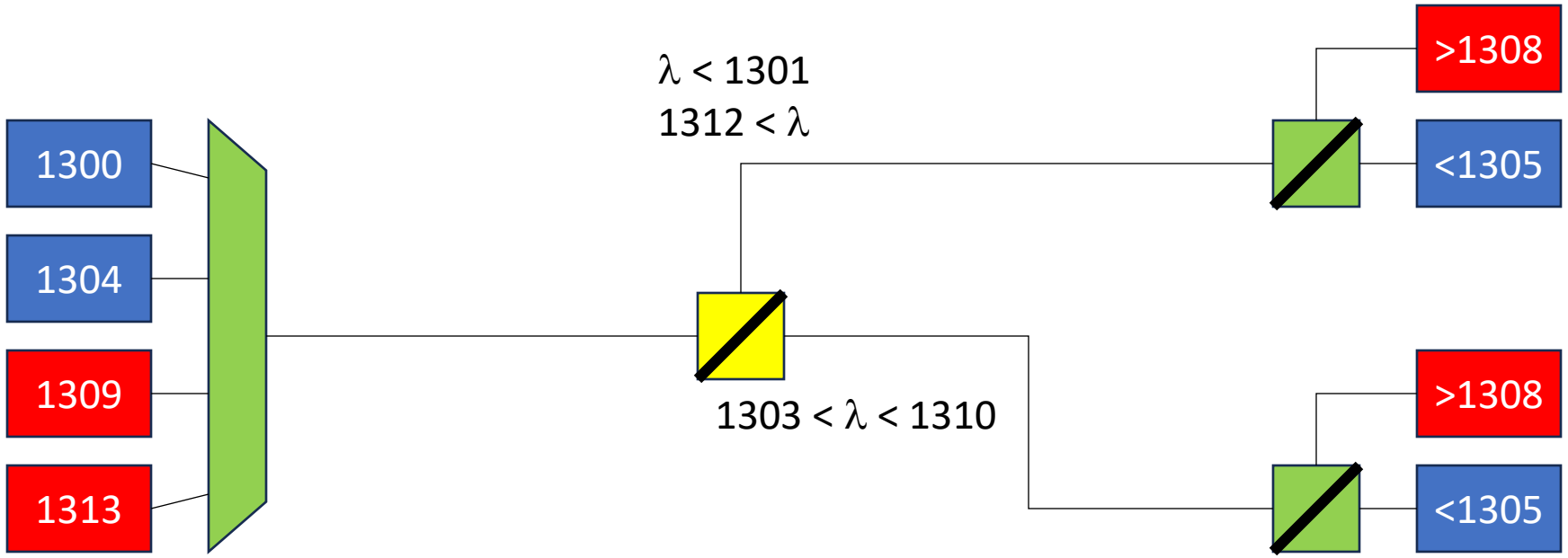
- The -60 to 30 ps/nm is somewhat conservative
  - The .3dj group has a “discussion” dispersion (max – min) range of 28 ps/nm
  - Scaling that to 100 Gb/s would be a range of 112 ps/nm, wider than 90 ps/nm
  - However, dispersion range is elastic: subject to trade-offs with all other penalties and power budgets
  - Namely, .3dj LR4 is a 10 km link with a modest loss budget
- We hope that the new work in Q5 will buy us the 25% reduction that we need, likely by moving to the 99.9 or 99% confidence level

Wavelength arrangements

- 100GBASE wavelengths are downstream 1304 and upstream 1309
- If we want to keep those as is, then we have two options:
  - Option 1: Downstream 1300 and 1304, upstream 1309 and 1313 nm
  - Option 2: Downstream 1304 and 1313, upstream 1300 and 1309 nm
- Options 1 and 2 make it possible to connect a 100 GBASE and 200 GBASE optic together

Option 2: 200G to 2 x 100G breakout

- If the 100 GBASE receiver bandwidths are implemented using a simple edge filter, then they are wide and could catch multiple channels
- Note: 100 GBASE transmitters would have to be tunable (far fetched?)



Wavelength option 3

- If we are willing to reassign the center two wavelengths, then have option 3:
  - Downstream 1300 and 1313, upstream 1304 and 1309 nm
- This is somewhat interesting in that it avoids the risk of bidirectional FWM in options 1 and 2
  - Detailed calculations are needed to determine if bidi FWM is a significant problem, as it only happens when link losses are small, but then the link has a large margin

Proposal

- At this moment, we are waiting on the ITU-T to give us the enhanced dispersion numbers
- However, we could have a straw-poll to indicate the preference of the group for
  - 200 GBASE solution based on the 4 wavelengths (1300 to 1313 nm)
  - Using the same power budgets as agreed for 100 GBASE
- With this straw poll result, the group could assemble the 200 GBASE clause as soon as the dispersion question is resolved

Thank you

Any questions?