

Multimode fiber media types for 802.3cd

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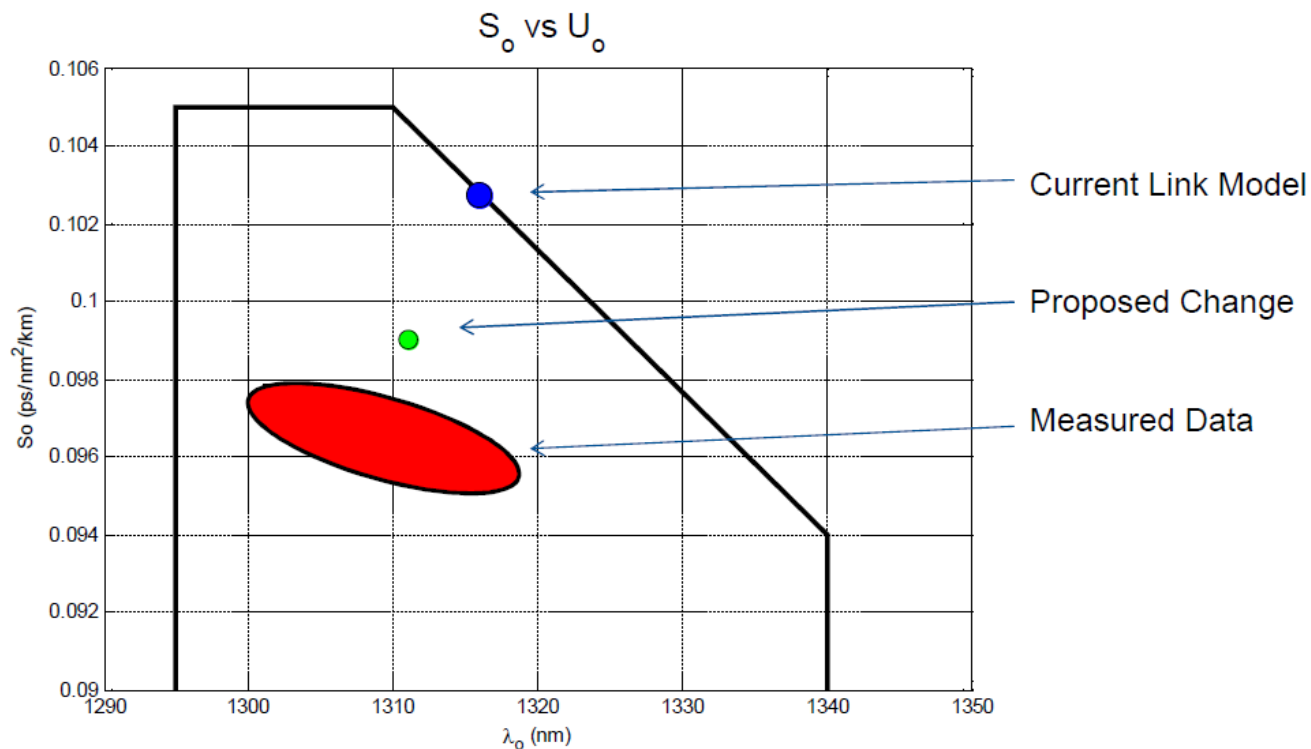
Laser Optimized Multimode Fiber Types

Fiber Type	EMB at 850 nm (MHz·km)	EMB at 953 nm (MHz·km)
OM3	2000	NA
OM4	4700	NA
WBMMF (OM4-W or OM5?)	4700	2470

- OM3 and OM4 designed for high bandwidth at 850 nm
- WBMMF designed high bandwidth over wide range of wavelengths

TIA Round Robin Report – Used for Specifying WBMMF CD

Utilize more realistic but conservative values for U_o and S_o



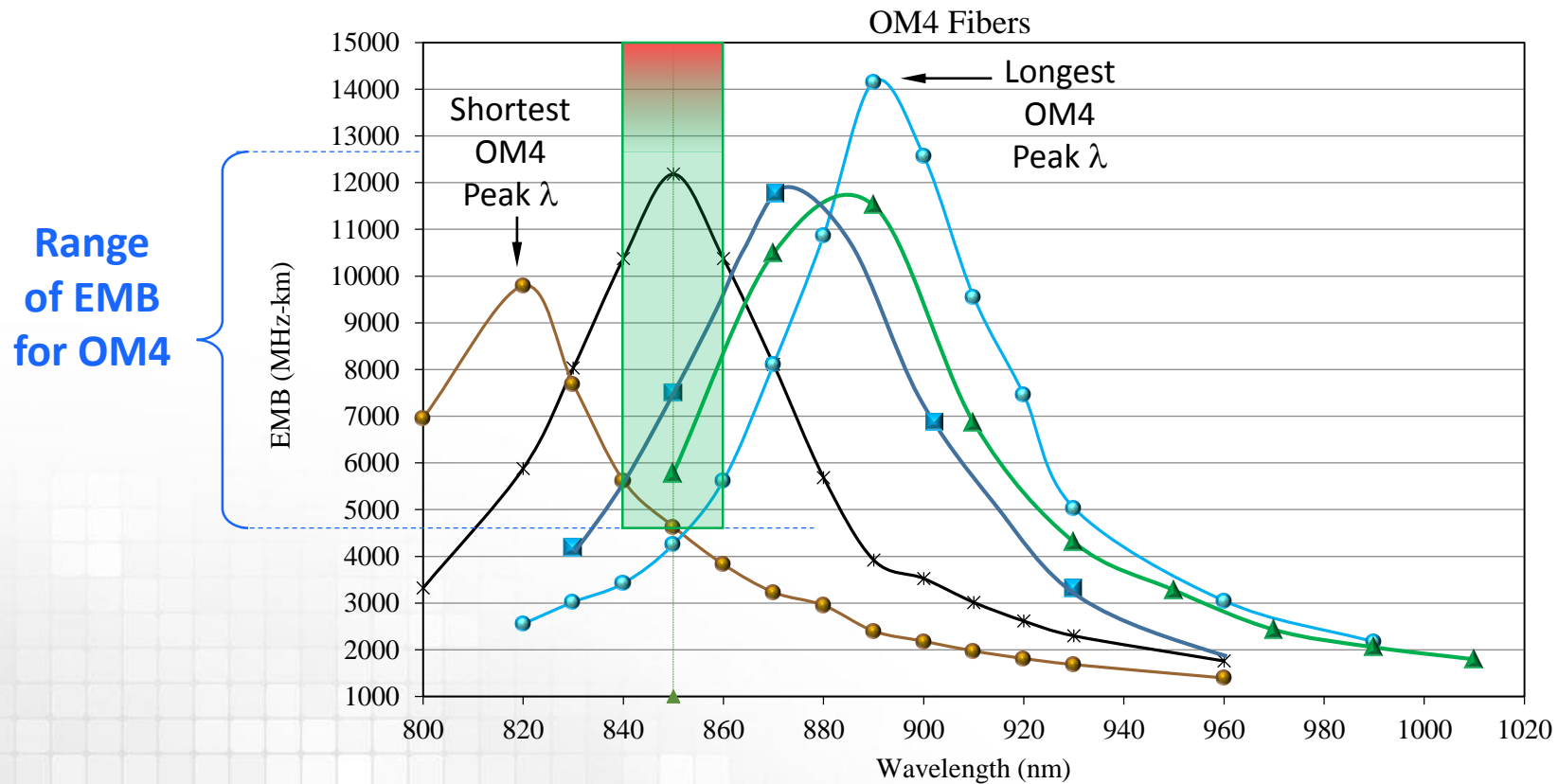
Standard MMF

Round Robin Participants

1. Corning
2. OFS
3. Panduit
4. Prysmian
5. J Fiber
6. YOFC

Range of EMB peak wavelengths for 5 OM4 fibers

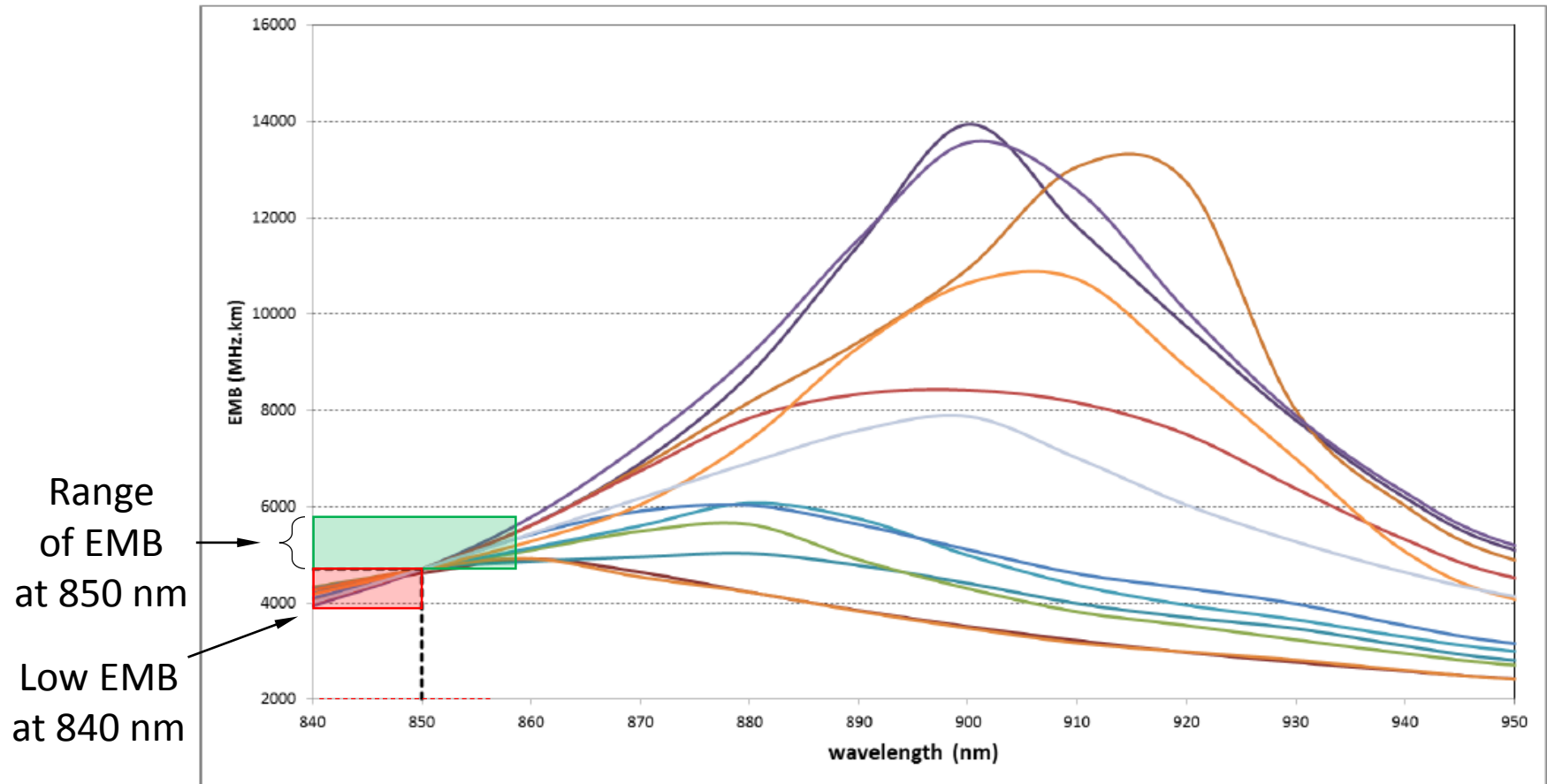
- EMB wavelength dependence



TIA 42.12 Presentation:

PANDUIT

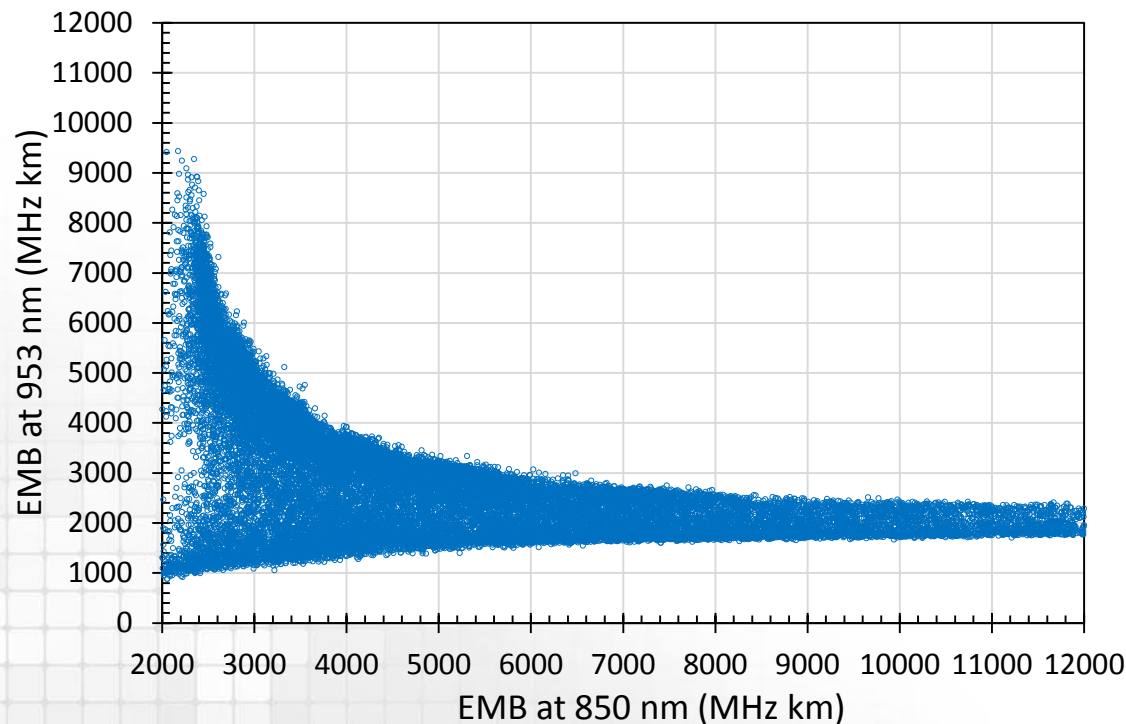
Wideband fibers with $EMB_c = 4700 \text{ MHz.km} @ 850 \text{ nm}$



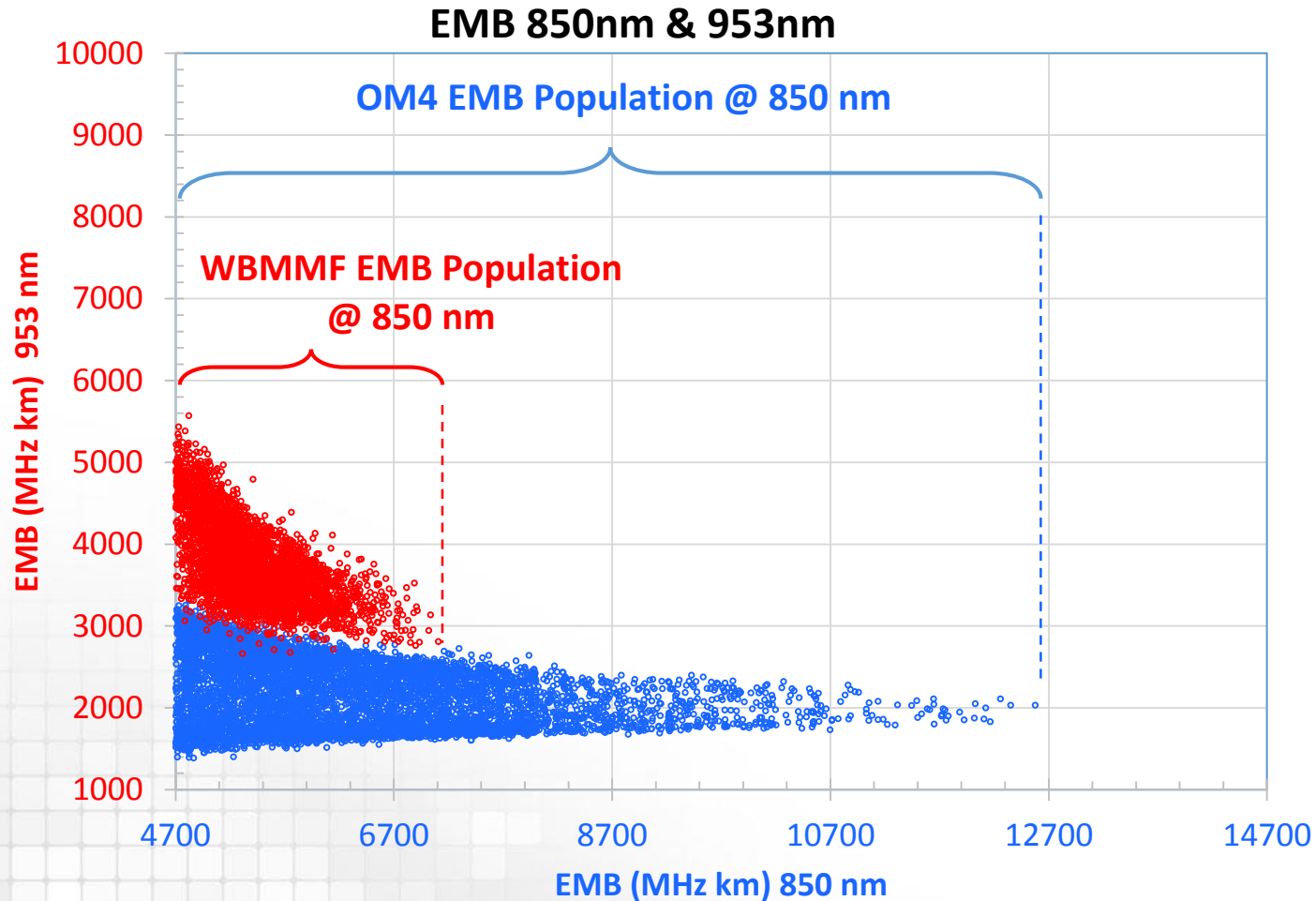
Source: TR42.12-2015-06-013

Modeling of OM4 EMB wavelength dependence

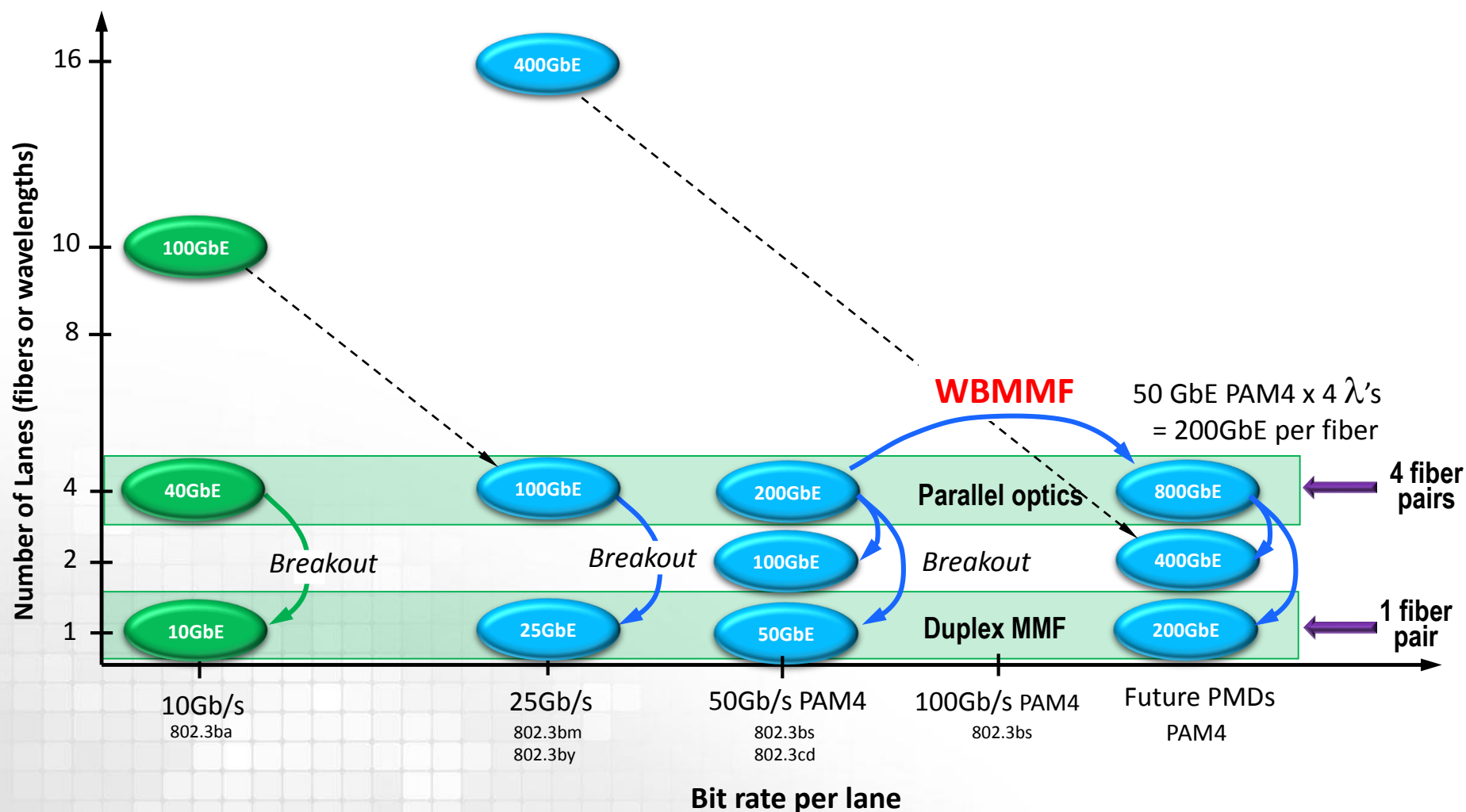
- Simulation parameters
 - Fibers with both perfect alpha profiles and perturbed refractive index profiles
 - Magnitude of index perturbation normally distributed w/ standard deviation $\sim 10^{-4}$
 - Population of 40000 MMFs per wavelength generated over the range 830 nm to 980 nm
 - Wavelengths varied in 1 nm steps
 - Total fibers-wavelength combination = 6 million
 - Blue dots represent the universe of MMFs including OM3 and OM4



Modeling of OM4 & WBMMF EMB wavelength dependence



WBMMF Required for Future higher speed Ethernet using SWDM



Conclusions

- Inclusion of WBMMF as a media type option for P802.3cd depends on which 100G solution is adopted
 - *Required for SWDM*
 - *Not Required for parallel optics (SR2)*
- For SWDM, OM3 & OM4 EMB is not specified for λ 's ≥ 860 nm
 - *Only WBMMF can be specified for 100G SWDM-2*
 - *PMDs will require different MMF types for different data rates*
- For parallel optics i.e., 100GBASE-SR2
 - *WBMMF provides no benefit*
(modal and chromatic dispersions are the same as OM4)
- Concerns
 - *Including or excluding MMF media types for 50/200G vs 100G will confuse customers*
 - *The use of OM4 for SWDM can result in channel failures*
- Premature to specify SWDM or include Wideband MMF in 802.3cd