# Test Methodology for VR Links

(in support of comment #65)

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# Fiber Bandwidth

- Fiber emulation for TDECQ test on VR links will be based on 50 m reach on OM4.
- The center wavelength range is 842 – 948 nm for VR. It is proposed that the wavelength range be split into four bands for the purpose of TDECQ test because fiber bandwidth varies widely over this range.
- Calculation of fiber bandwidth:

  EMB for OM4 fiber
  kolesar_3cm_01_1120.pdf

  Fiber chromatic dispersion expression on slide 4 and parameters from slide 8 in
  abbott_3db_adhoc_01_080620.pdf

| | |
|---|---|
| $S_0$ | 0.093477 ps/(nm$^2$·km) |
| $U_0$ | 1328 nm |

## OM4 minimum EMB guidance in IEC

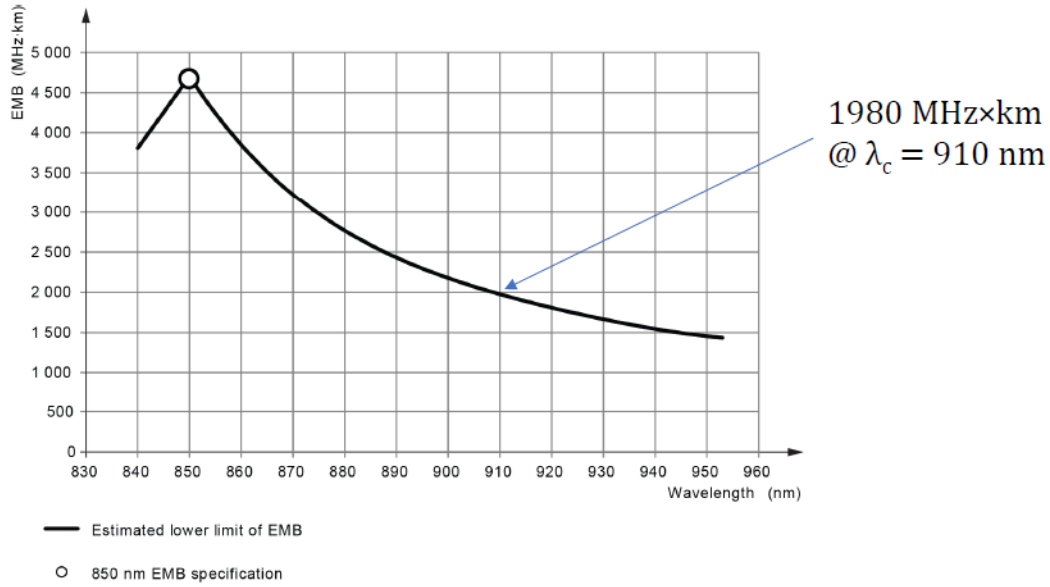
For $840\ \text{nm} \leq \lambda_c \leq 850\ \text{nm}$

$$\text{EMB} \geq 3840 + (4700 - 3840) \times (\lambda_c - 840)/(850 - 840)$$

For $850\ \text{nm} \leq \lambda_c \leq 953\ \text{nm}$

$$\text{EMB} \geq 4700 \times (1.0002 - 2.1549x + 03.2700x^2 - 2.7328x^3 + 0.9280x^4)$$

Where $x = (\lambda_c - 850)/(953 - 850)$




**Estimated minimum wide band EMB versus wavelength for A1-OM4**

# Wavelength Bands and TDECQ Reference Filter BW for VR

TDECQ Measurement:

- The first filter represents the system receiver with a -3dBe bandwidth of approximately 26.5625 GHz.
- The second filter (4$^{th}$ order Bessel-Thomson) represents the fiber dispersion and values are shown in the table below.

| Center Wavelength (range) (nm) | Fiber emulation (-3dBe bandwidth)* (GHz) |
|---|---|
| 842 – 868 | 33.6 |
| 842 – 888 | 29.6 |
| 842 – 918 | 24.5 |
| 842 – 948 | 20.7 |

* calculated for RMS spectral width of 0.65 nm.