Continuing Work on Baseline Proposals for 200G/L 500m and 2km Objectives

Brian Welch (Cisco Inc.)

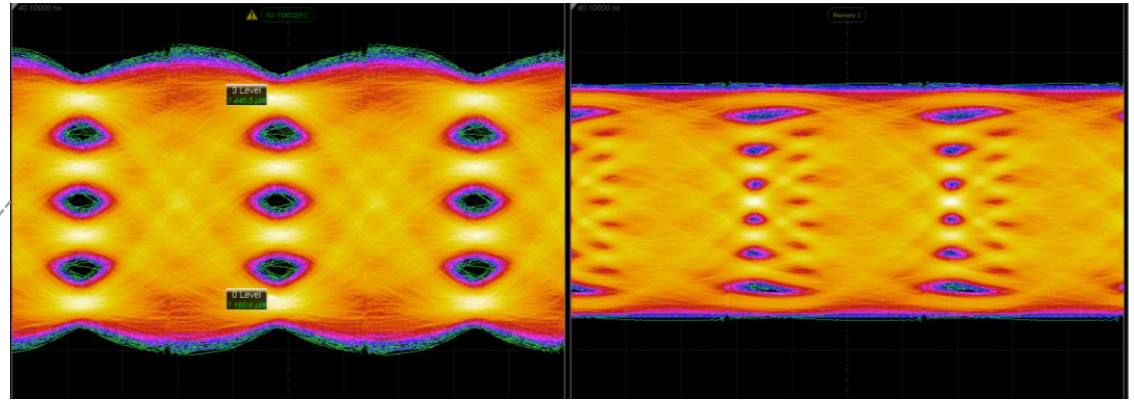
Romesh Nandwana (Cisco Inc.)

Overview

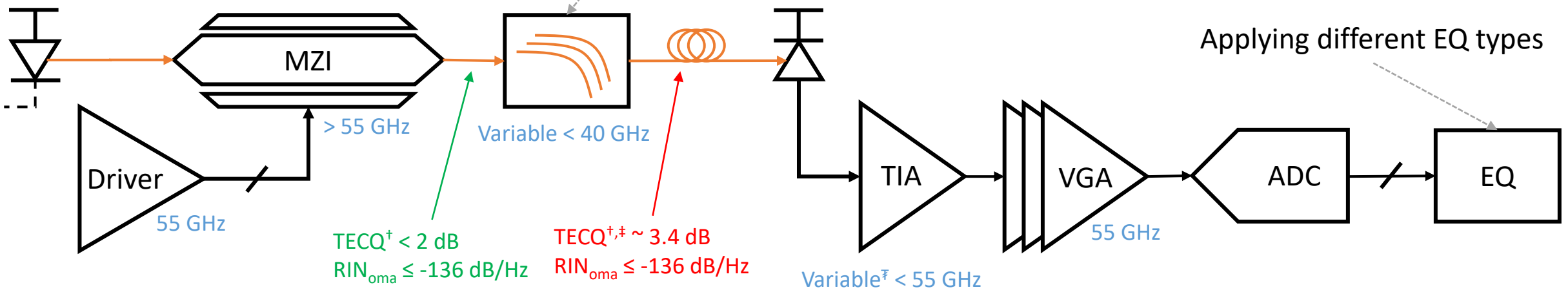
- Objectives of Interest:
  - 200GE: 200GBASE-DR1, 200GBASE-DR1-2
  - 400GE: 400GBASE-DR2, 400GBASE-DR2-2
  - 800GE: 800GBASE-DR4, 800GBASE-DR4-2, 800GBASE-FR4
  - 1.6TE: 1.6TBASE-DR8, 1.6TBASE-DR8-2

- Primary intent is to compare link performance for different rates and equalization types, and comparisons to FEC options.
  - Coding gain vs. overhead
  - Simulating effects of adding DFE, improving Rin, adding MLSE

Simulation Setup



Additional filtering (4th order BT) applied to create max TECQ

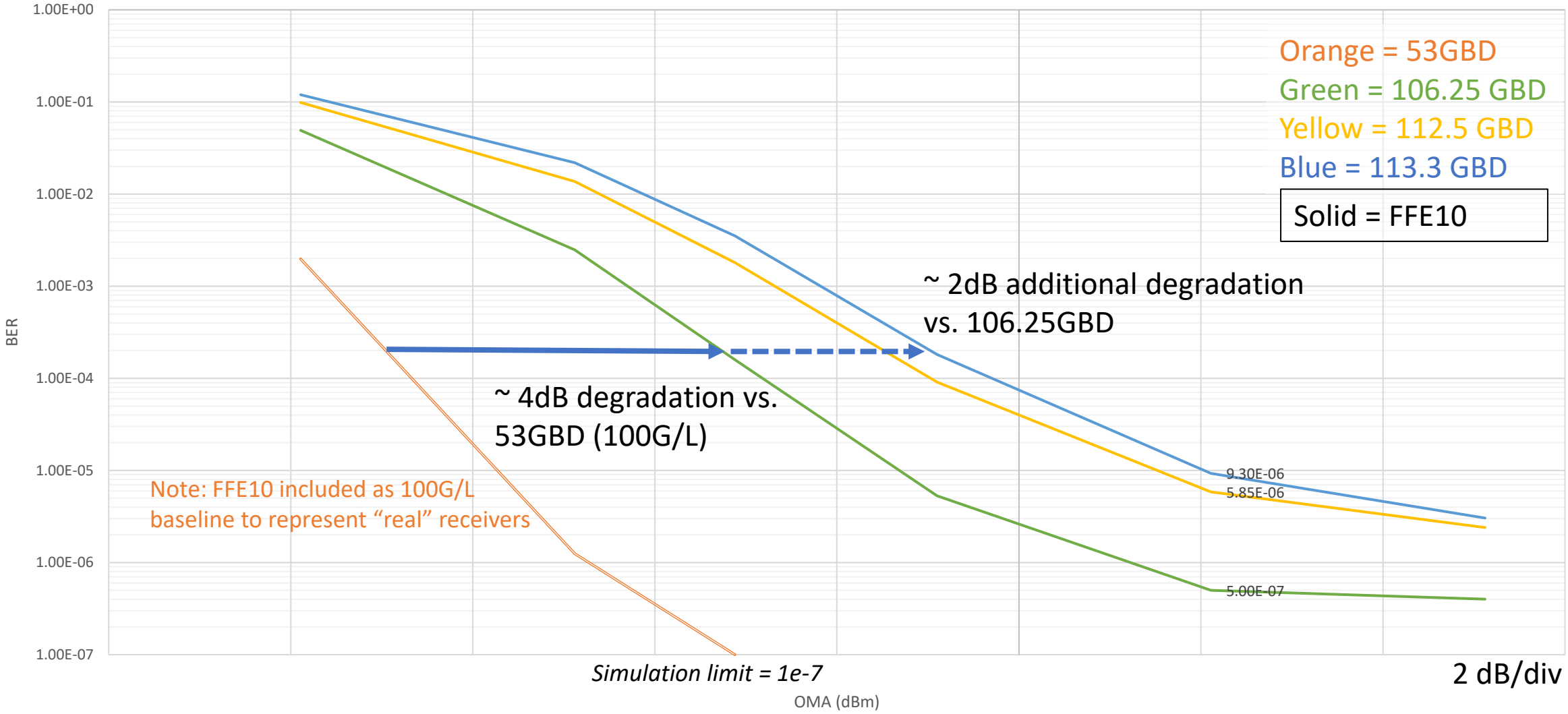


† TECQ measured in accordance with 121.8.5: 0.5xBaud Rate reference filter, FFE5 reference EQ, SER = 4.8e-4

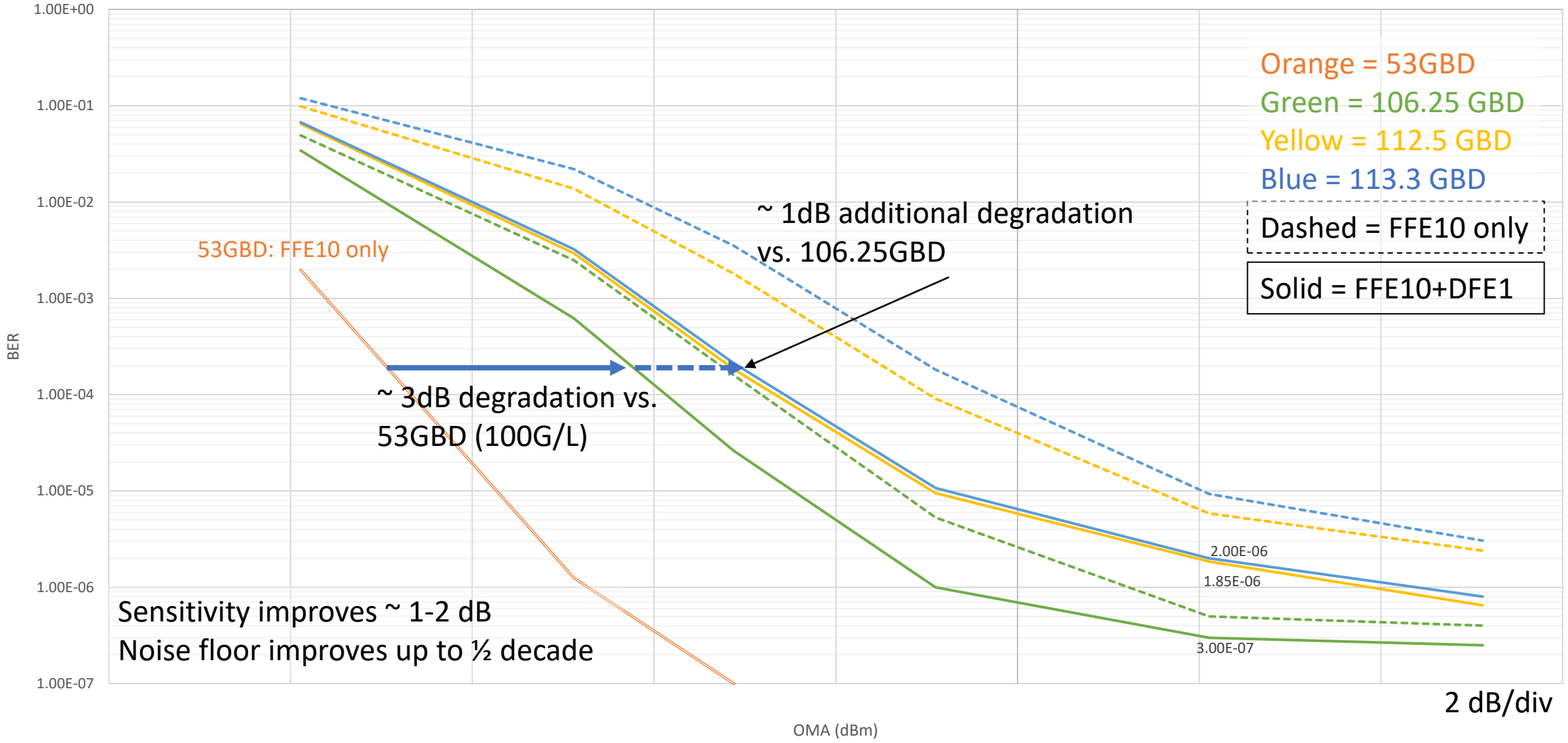
‡ Dispersion not modeled in current simulations

₮ Filter response ∝ Butterworth

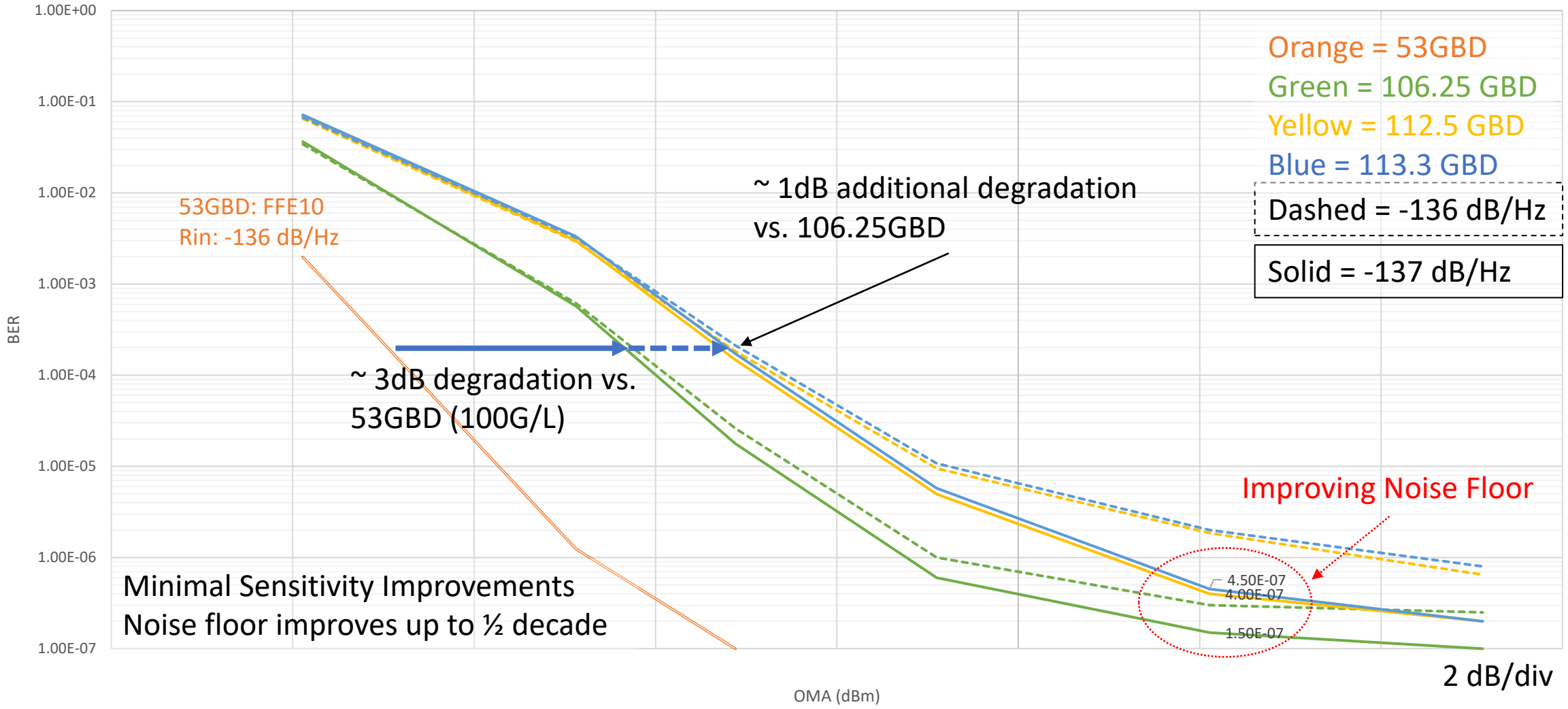
Baseline: Comparisons to 100G/L



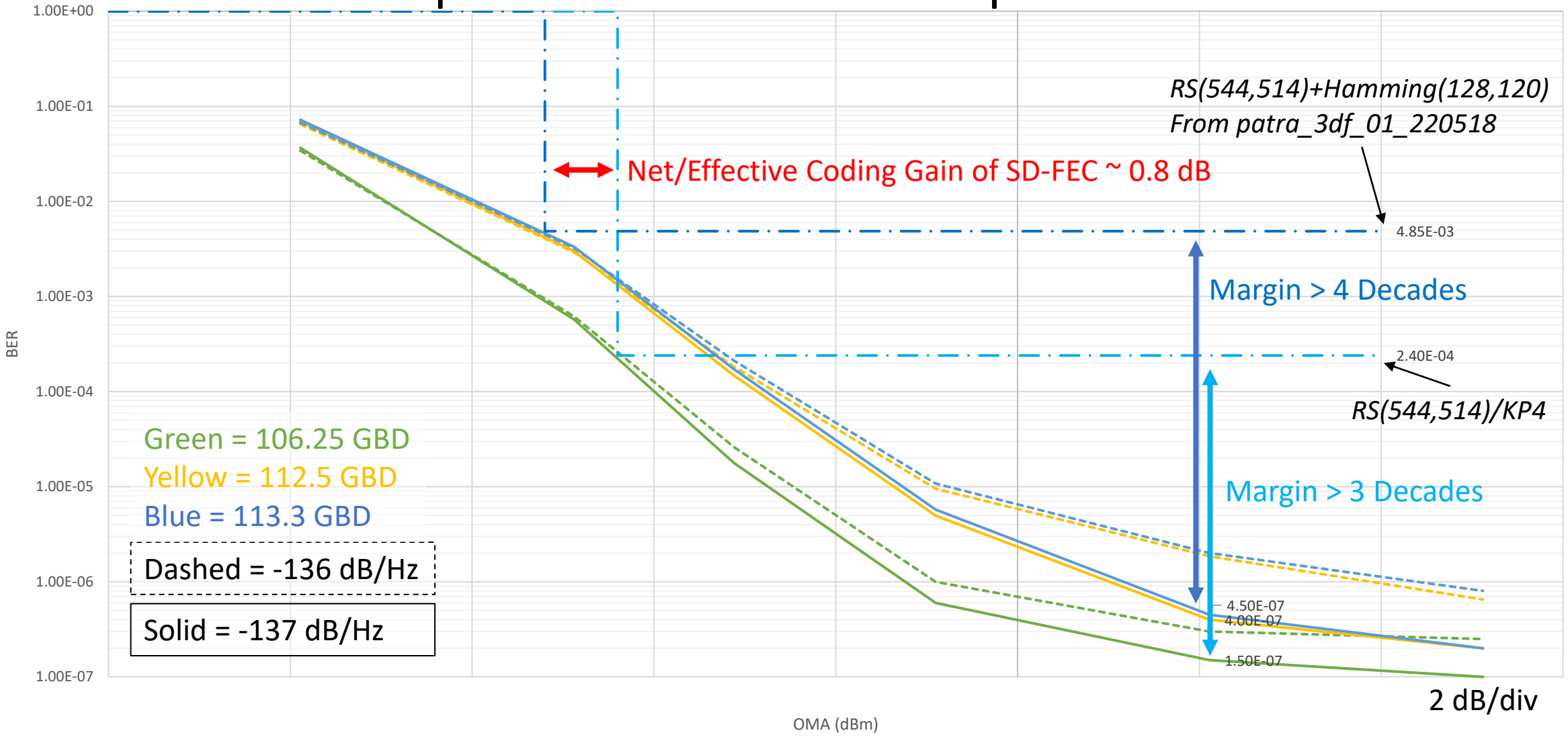
Case 1: Adding DFE1



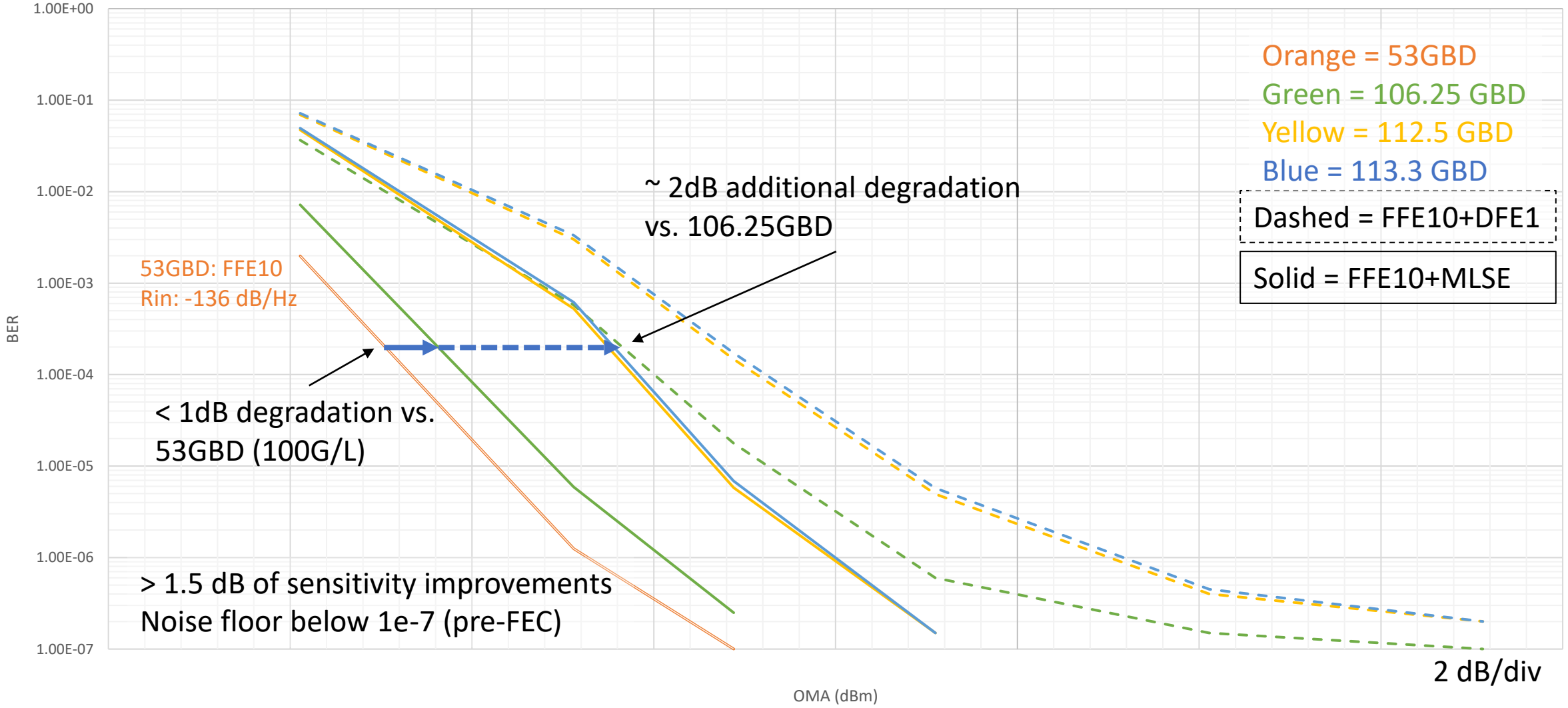
Case 2: DFE1 with RIN_{oma} improved to -137 dB/Hz



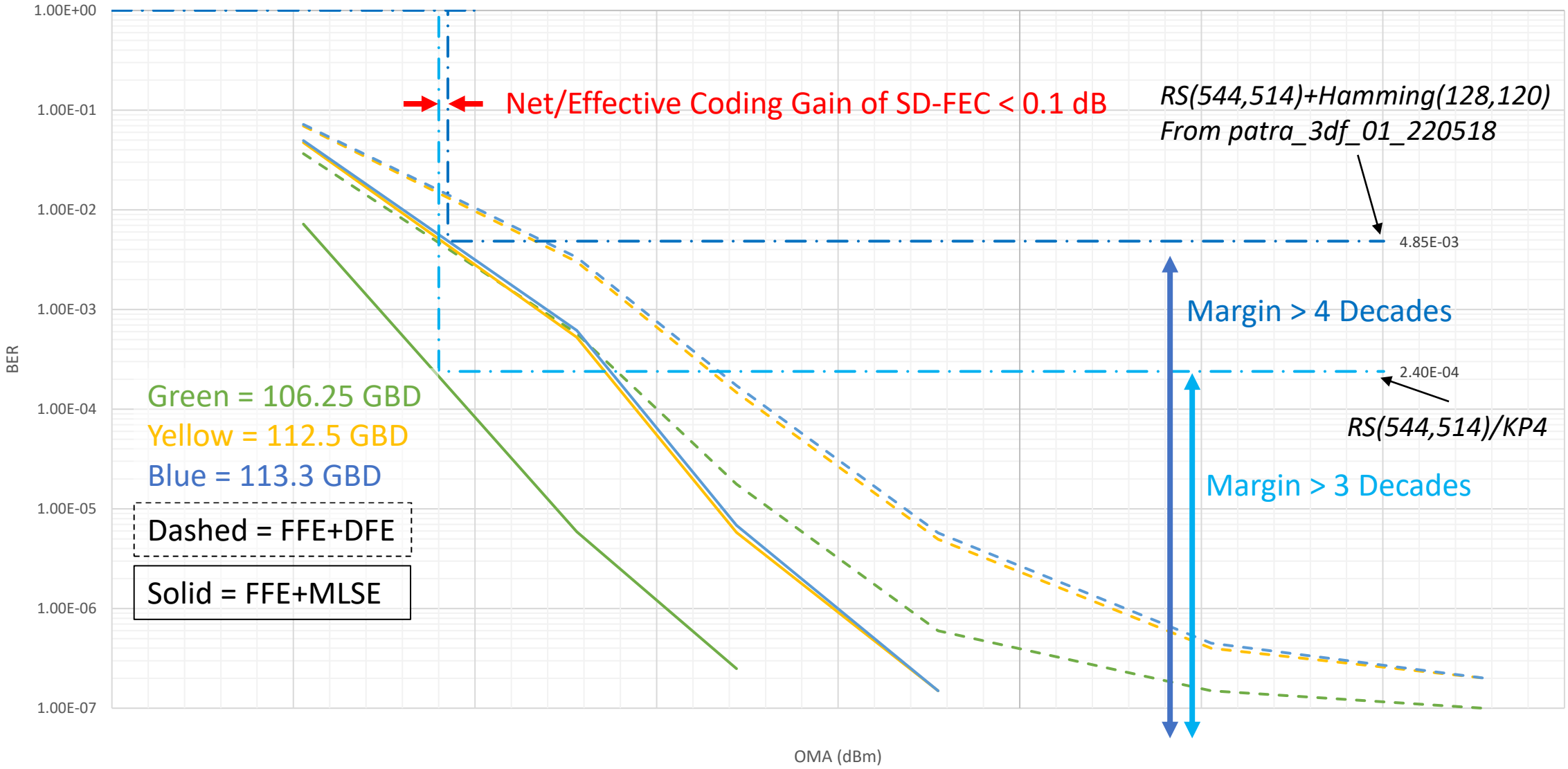
Case 2: Comparisons to FEC Options



Case 3: MLSE with RIN_{oma} of -137 dB/Hz



Case 3: Comparisons to FEC Options



Summary and Observations

- **More Analysis Needed**
  - Investigate different filter types/responses for creating max TDECQ
- Increasing baud rate impacts pre-FEC BER curve
  - Also expected to impact module power, more study needed.
- RS(544,514) may be viable for 200G/L
  - Degradation vs. 100G/L may be ≤ 2dB
  - Margin to noise floor ≥ 3 decades
- Net/effective coding gain of SD-FEC reduced by increase of baud rate
  - Assuming the same transmitter (same EQ & SER applied for TECQ calibration) and receiver (same bandwidth).

Thank You