



## **400GBASE-ER8 QDD Module Tests for Reaches of 40/50km**

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# Outline

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Test setups

Measurement Results

Summary

# Test Setup Schematics

## 400G ER8 Test Block Diagrams

- Running 40/50km fiber in QSFP-DD Format
- Leverage LR8 TOSA and ROSA design



# Test Setup Details

## 400G ER8 Demo at OFC'19

- 400G Technology Demo for Running 40/50km fiber in QSFP-DD Format.
- Transmit side leverages LR8 TX with ER of over  $>5.6\text{dB}$  and TxOMA around  $+1.0 - 2.1\text{ dBm}$  for all 8 channels
- RxOMA sensitivity at B2B falls within  $-16.6$  to  $-18.4\text{dBm}$  for all 8 channels.
- Run 40km vendor A, 50km vendor B
- PRBS  $2^{31}-1$  pattern



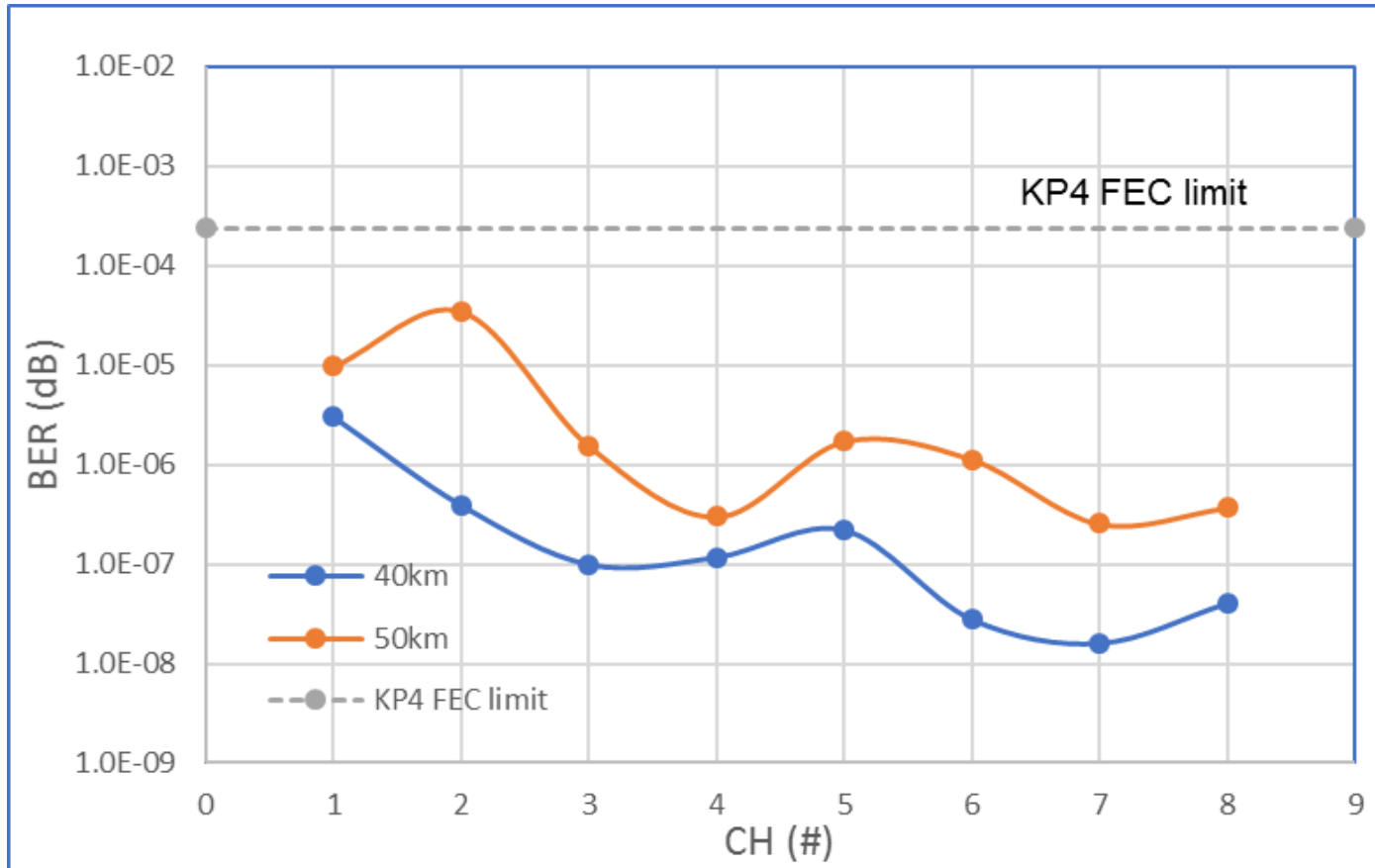
# Fiber Sample Characteristics

Fully tested G.652 Fiber

	Vendor A	Vendor B
Length (km)	40.04	50
Attenuation @ 1310nm (dB/km)	0.335	0.274
$\lambda_0$ (nm)	1312.237	1307
Dispersion slope (ps/nm <sup>2</sup> -km)	0.0868	0.086-0.088
Fiber link loss with jumpers (dB)	~14.8	~15.3

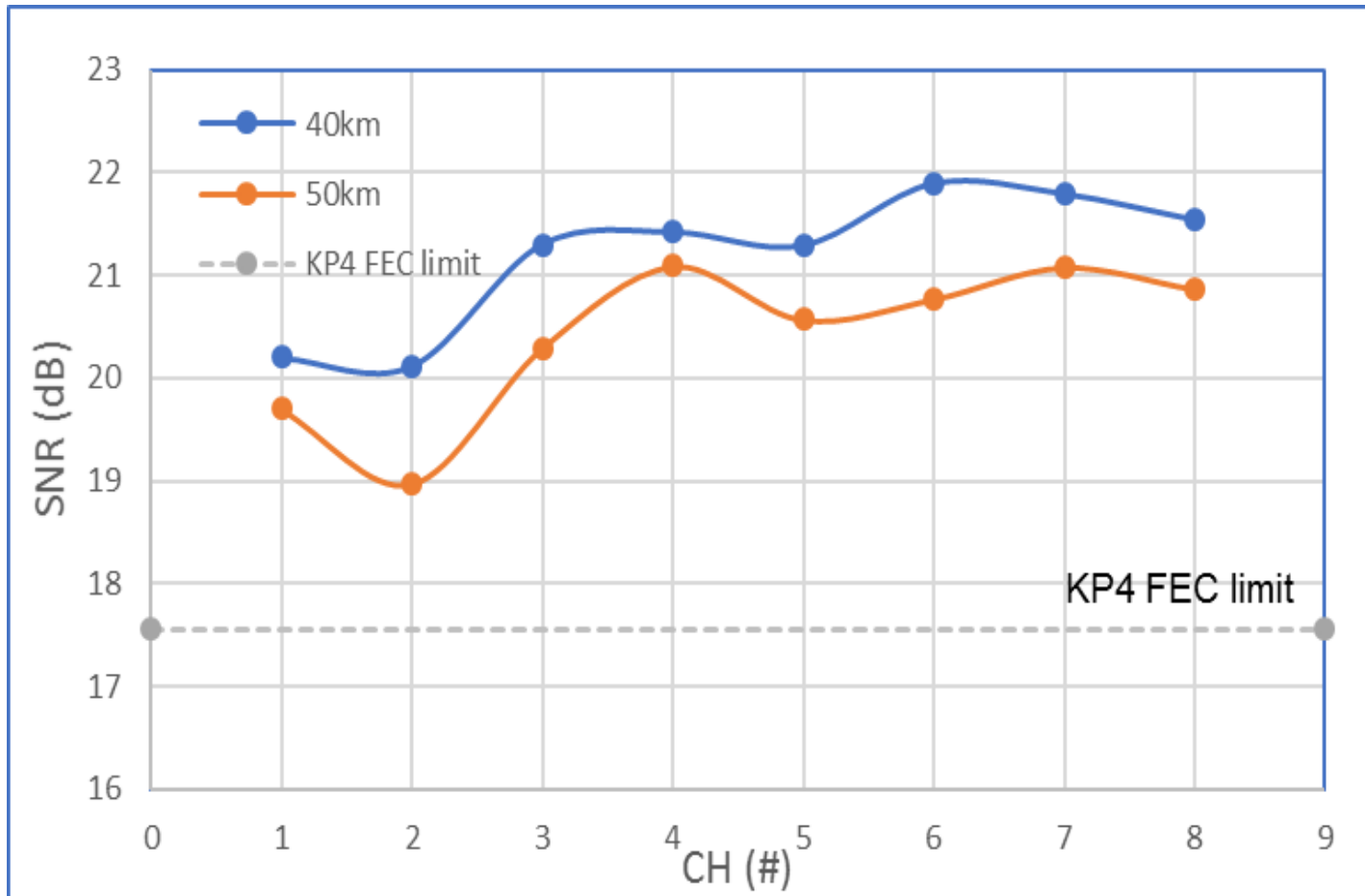
# 40/50km BER Performance (ROSA#1)

BER over 40/50km fiber indicating good margin



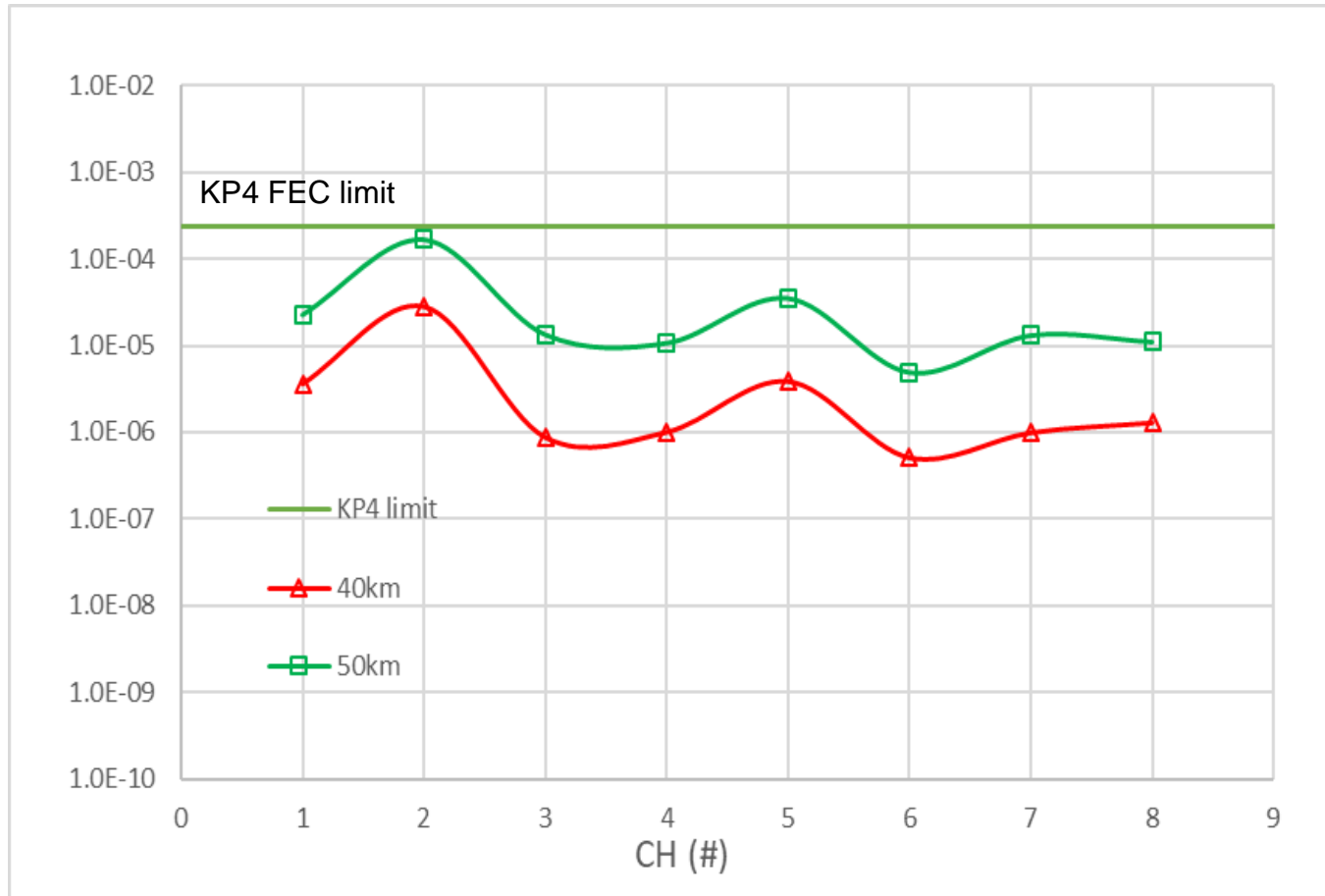
# 40/50km SNR Performance (ROSA#1)

SNR over 40/50km fiber indicating good margin



# 40/50km BER Performance (ROSA#2)

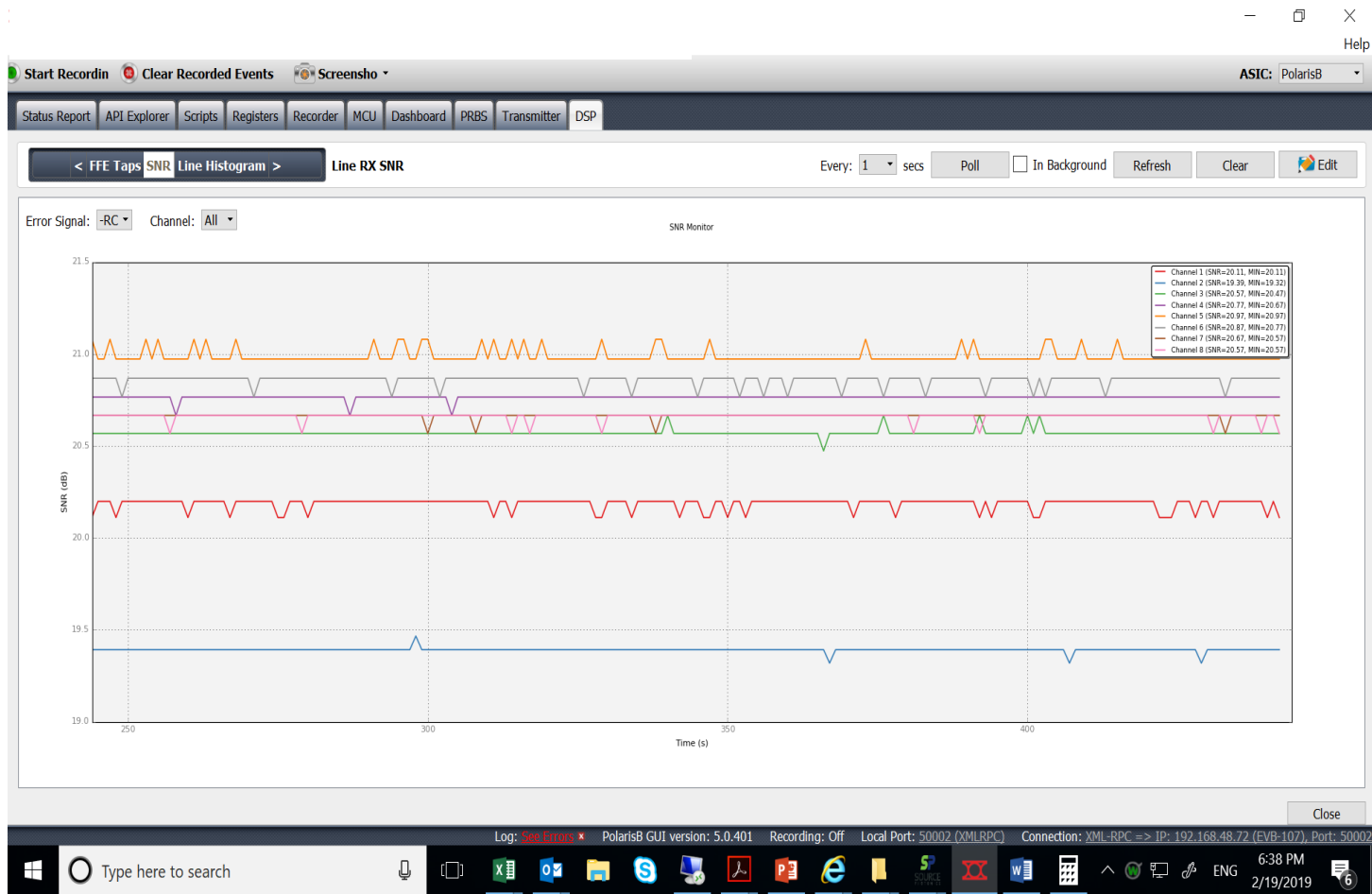
One more data point for different ROSA





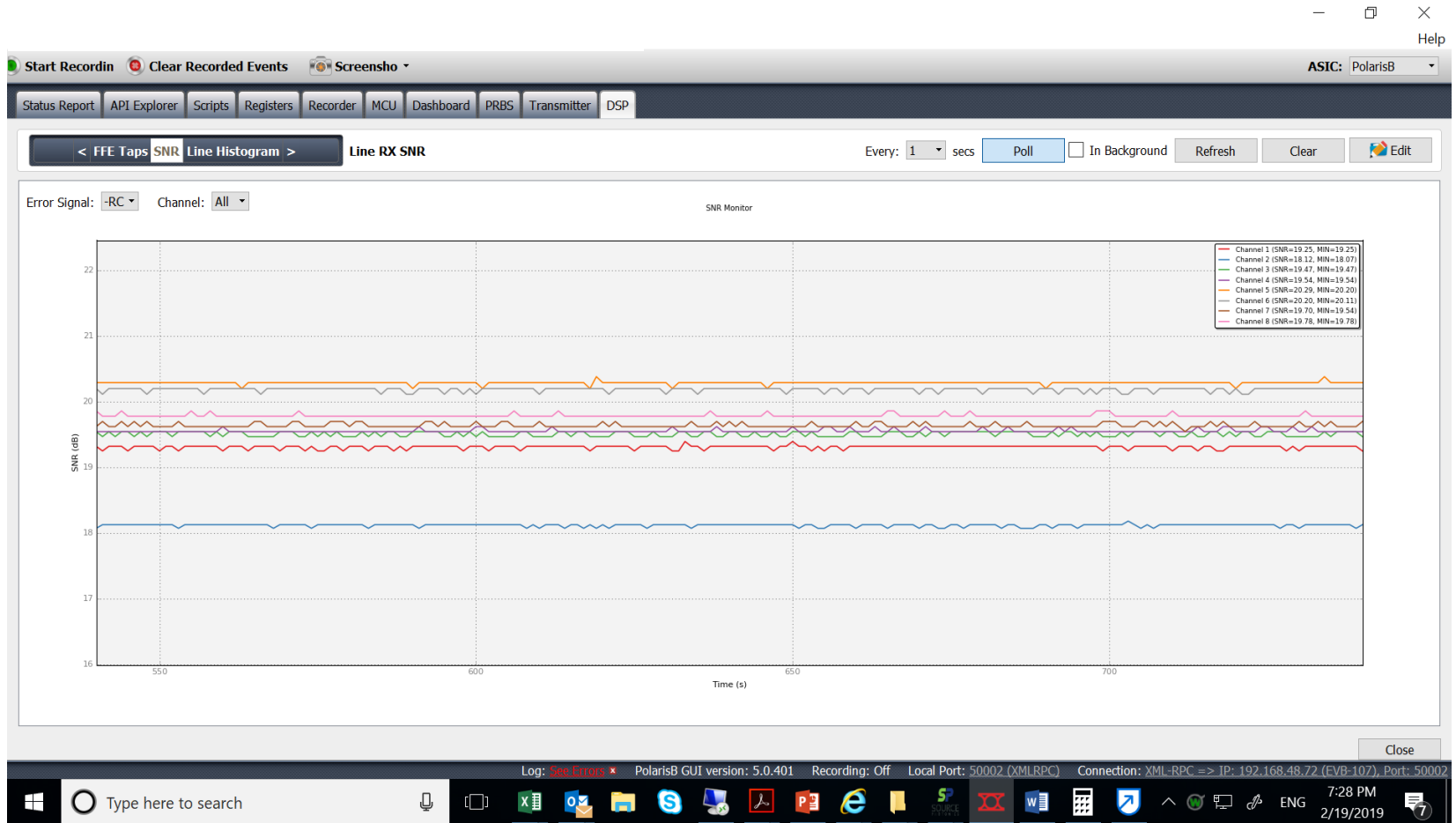
# SNR Consistency at 40km

Stable SNR with 40km fiber indicating dispersion is less of an issue



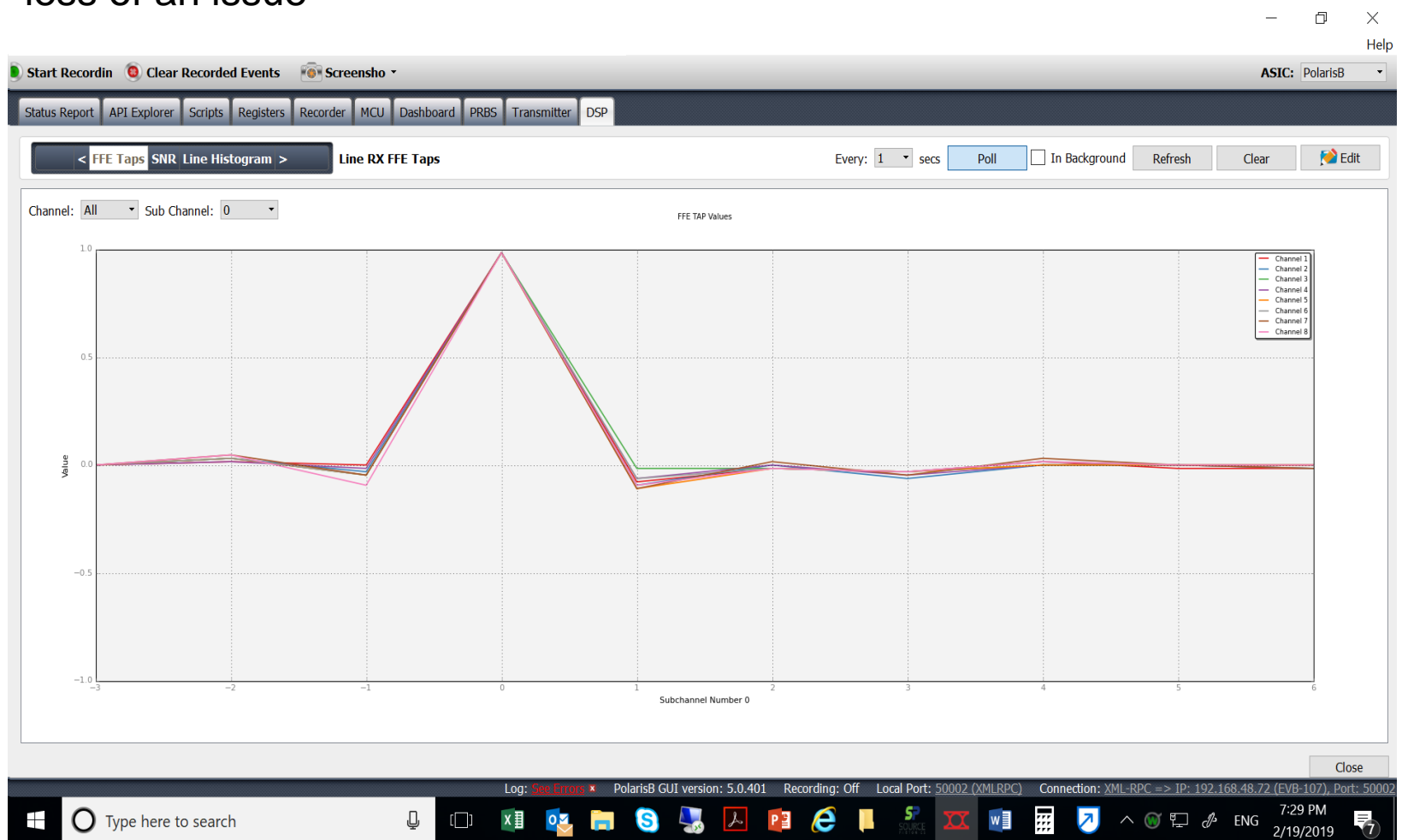
# SNR Consistency at 50km

Stable SNR with 50km fiber indicating dispersion is less of an issue



# FFE Stability at 50km

Consistent FFE taps over 8 channels with 50km fiber indicating dispersion is less of an issue



# Summary

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- Successfully demonstrated 400GbE-ER8 running 40/50km SMF with margin at OFC'19.
- Dispersion seems less an issue at LWDM for ER8.
- Other baseline parameters like TX launching power and link budget will be investigated further.

THANK YOU!

