



ptium

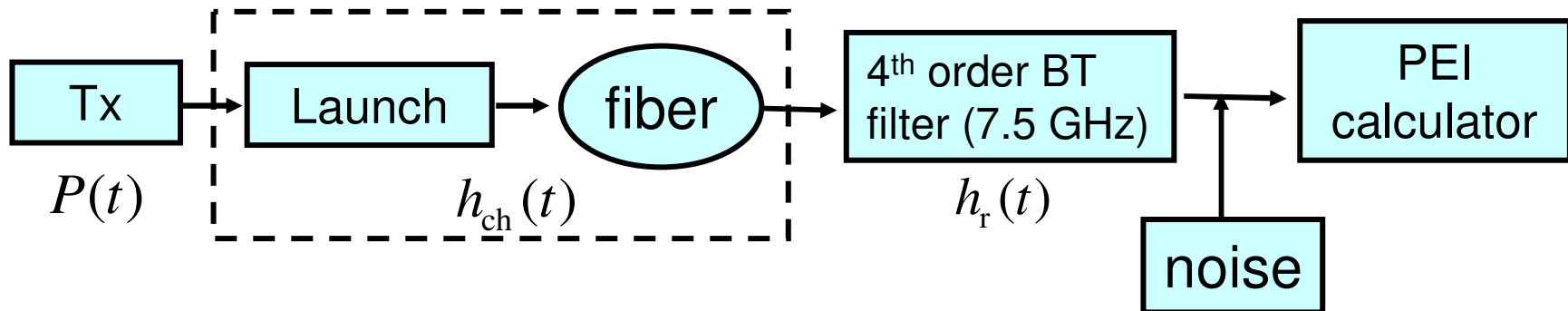
Breakthrough Technology for Optical Transmission

**Preliminary results of PIE comparison:
pulse width and distance**

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Company Proprietary

Simulation setup and PEI calculation



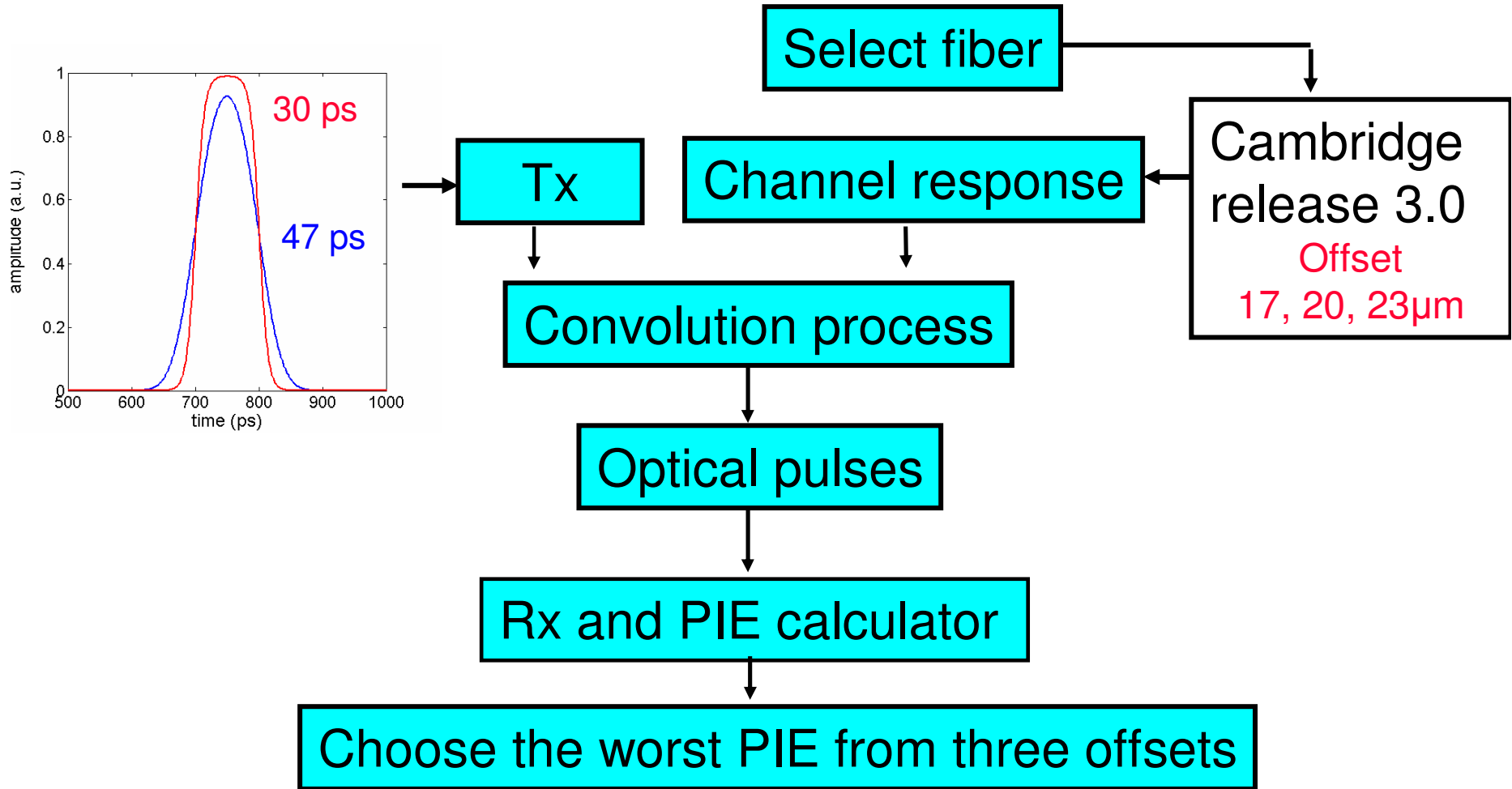
- Channel is simulated using **in-house simulator (center launch) and Cambridge release 3.0 (OSL: 17 μ m, 20 μ m and 23 μ m)**
- Composite pulse response $h(t) = p(t) * h_{ch}(t) * h_r(t)$
- Noise is a constant (bhoja_1_0704.pdf)

$$\sigma^2 = 10^{(\text{ESNR} - 2 * \text{optical dispersion penalty}) / 10}, \text{ where}$$

$$\text{ESNR} = 17\text{dB (BER} = 10^{-12}\text{)};$$

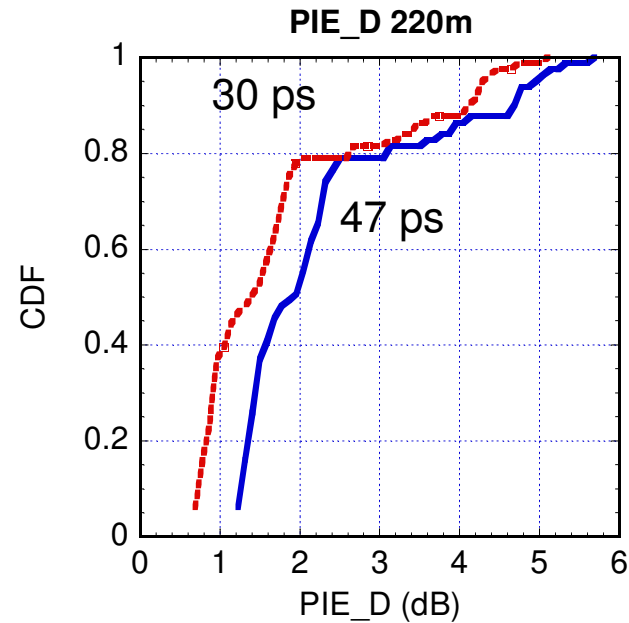
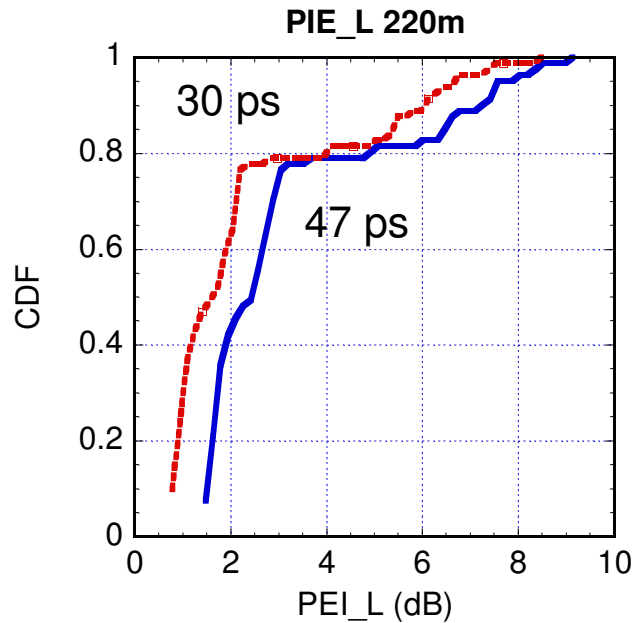
$$\text{optical dispersion penalty} = 6\text{dBo}$$

Effect of input pulse width on PIE metrics



The process is repeated for all 81 fibers.

Effect of input pulse width on PIE metrics

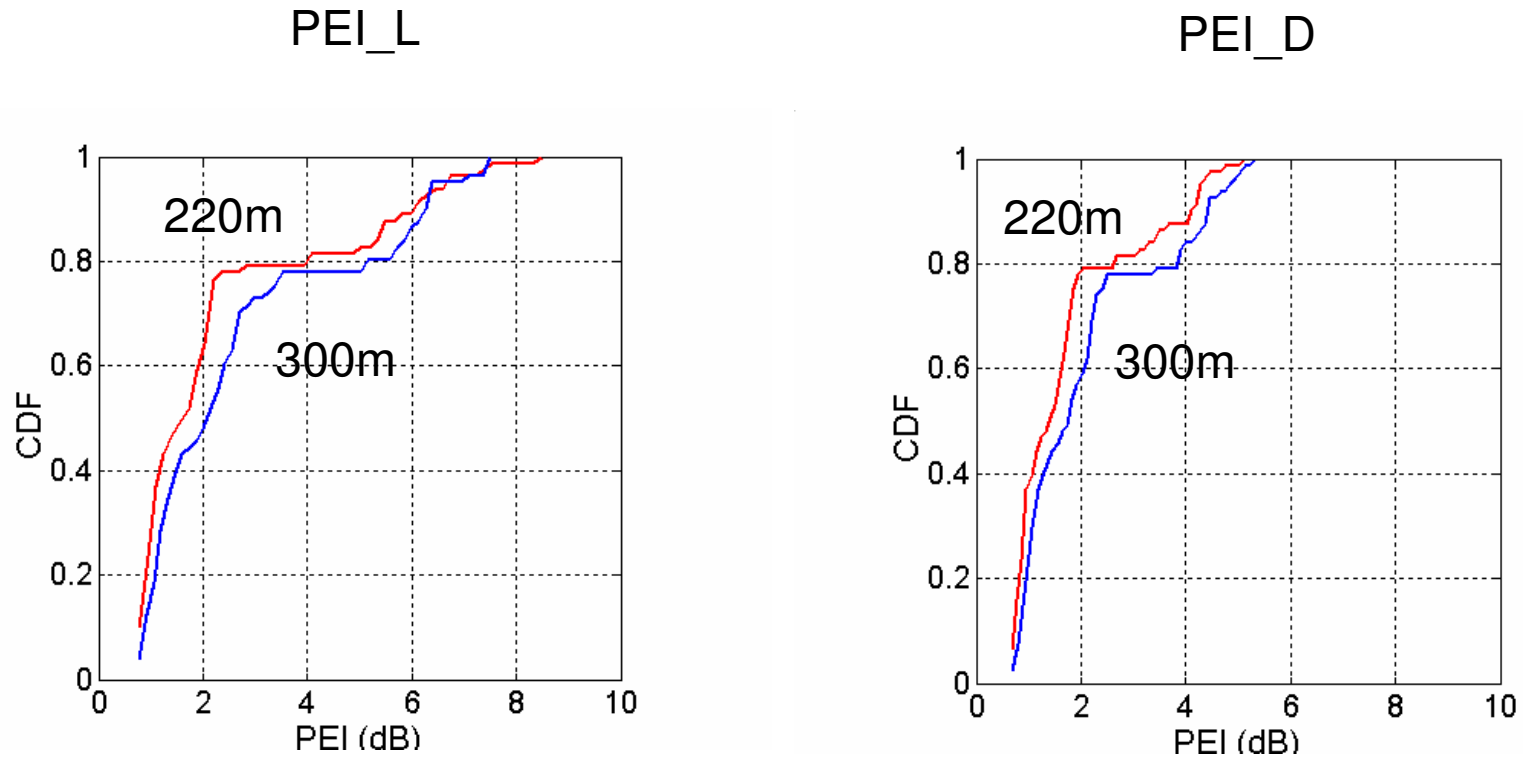


80 % coverage	PIE_L	PIE_D
30 ps	4.0	2.62
47 ps	4.76	3.13

Coverage of 4.5 dB	PIE_L	PIE_D
30 ps	82%	97.5%
47 ps	79%	87.5%

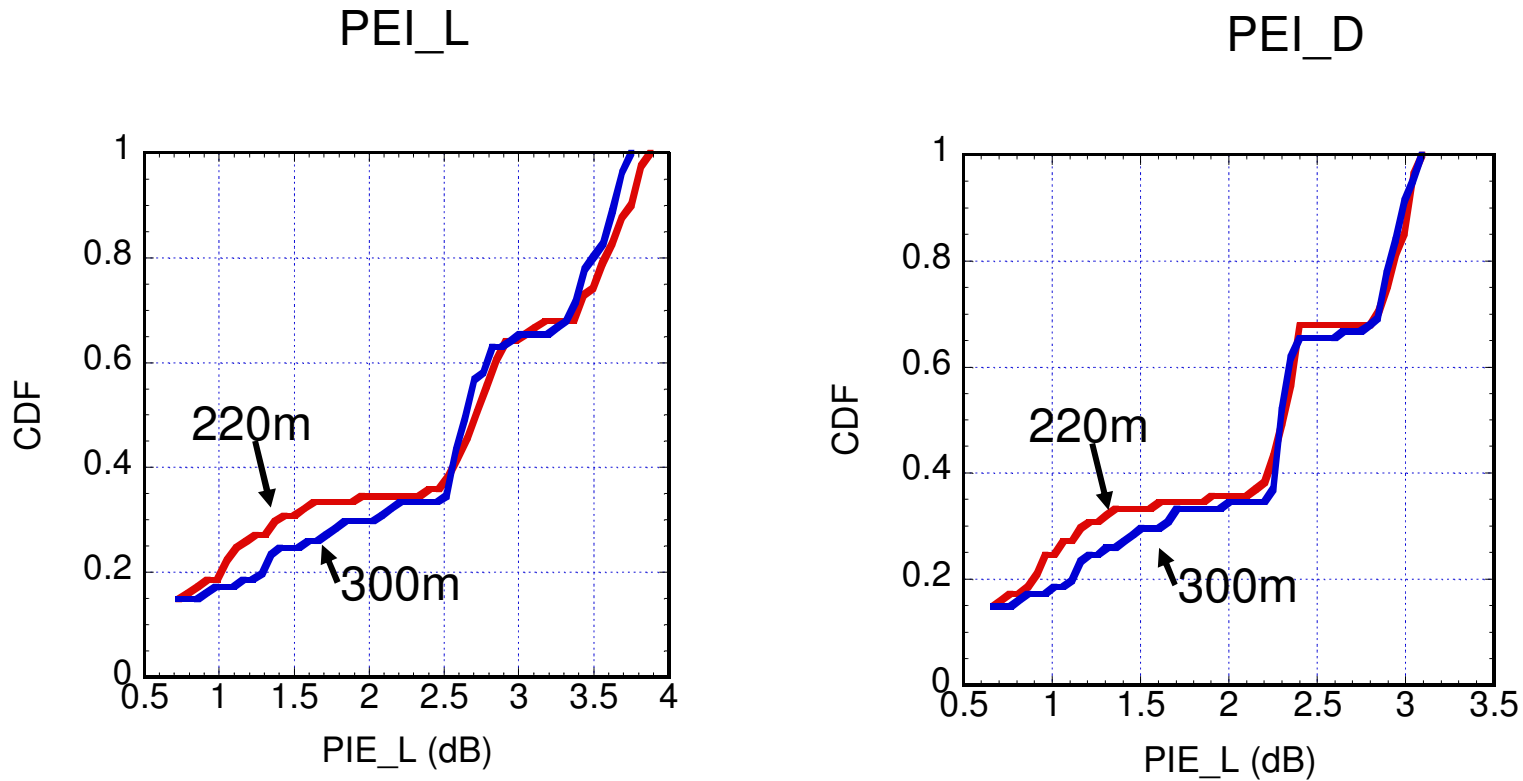
In the following study, 30 ps rising time is used.

PIE metrics of OSL (+/- 3 μm)



80% coverage	PEI_L	PEI_D
220m	4.0	2.62
300m	5.15	3.85

PIE metrics of center launch ($\pm 5 \mu\text{m}$)



80% coverage	PEI_L	PEI_D
220m	3.6	2.9
300m	3.5	2.9

Change of PIE metrics

- PIE metrics of different input pulse are compared.
- PIE metrics of different distance are compared.
- PIE metrics of offset launch degrade as the distance increase.
- PIE metrics for center launch is not sensitive to the change of fiber length.
- PIE_L and PIE_D metrics metrics for center launch case meet the 4.5 dB specified penalty at 220 m and 300m