

Investigating Electroabsorption Modulated Lasers at the Centre for Integrated Photonics

By Daisy Shearer

Place of work

- The Centre for Integrated Photonics, Ipswich UK

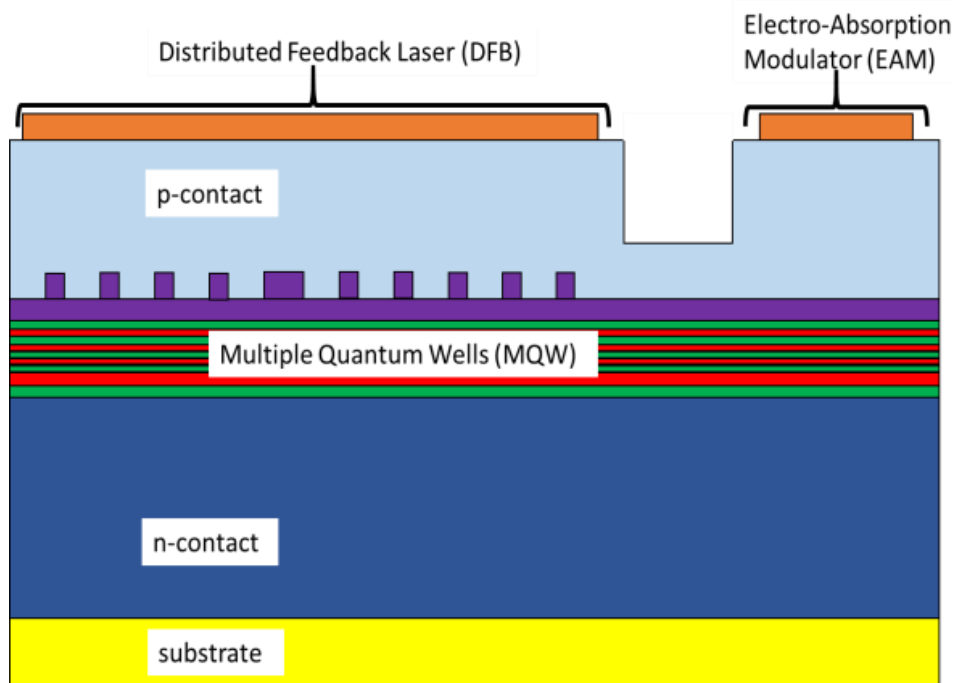


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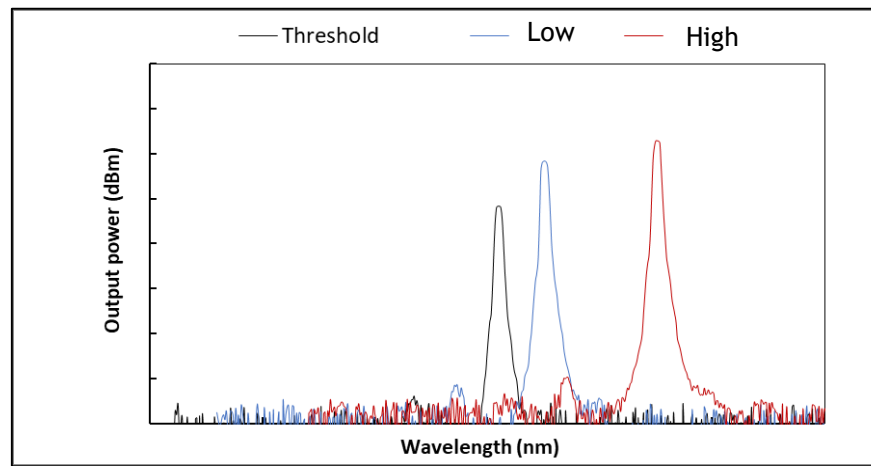
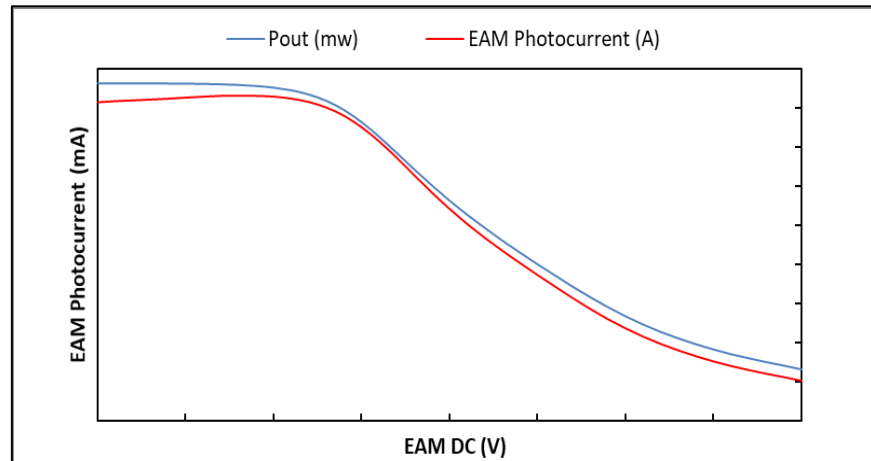
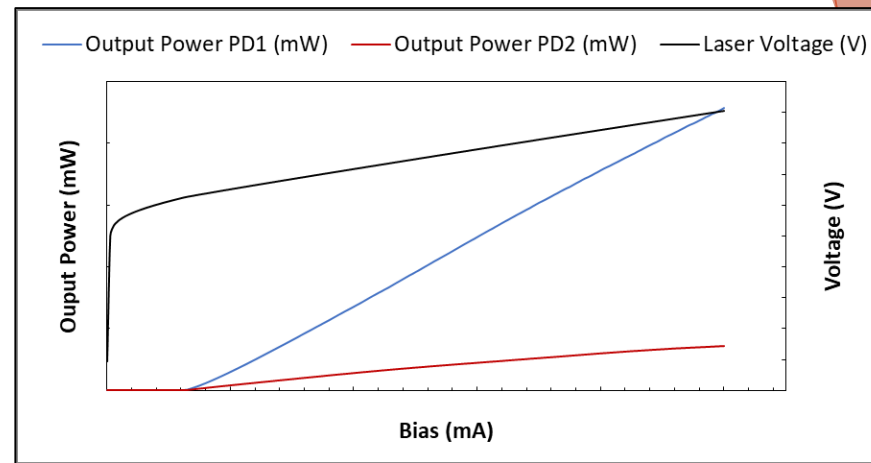
Project Overview

- Electroabsorption Modulated Lasers (EMLs)
- DC & High-Speed Characteristics



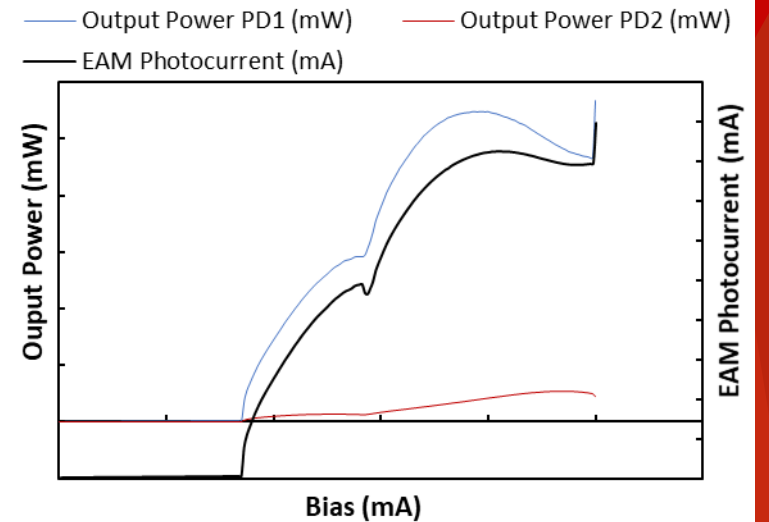
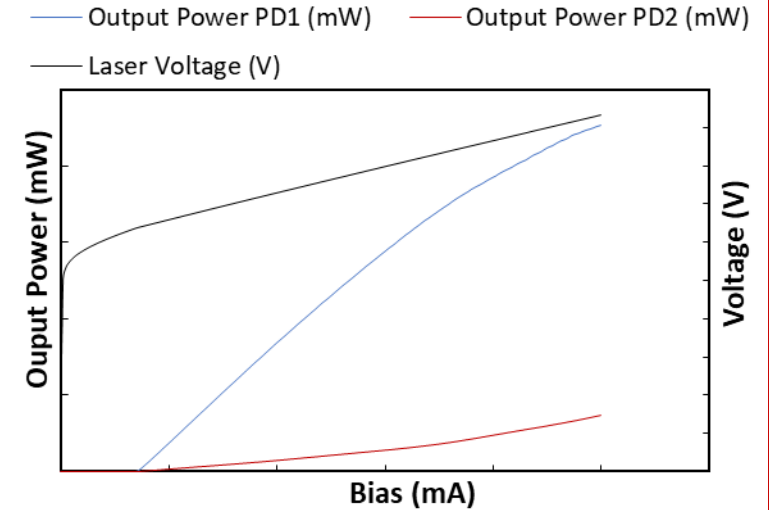
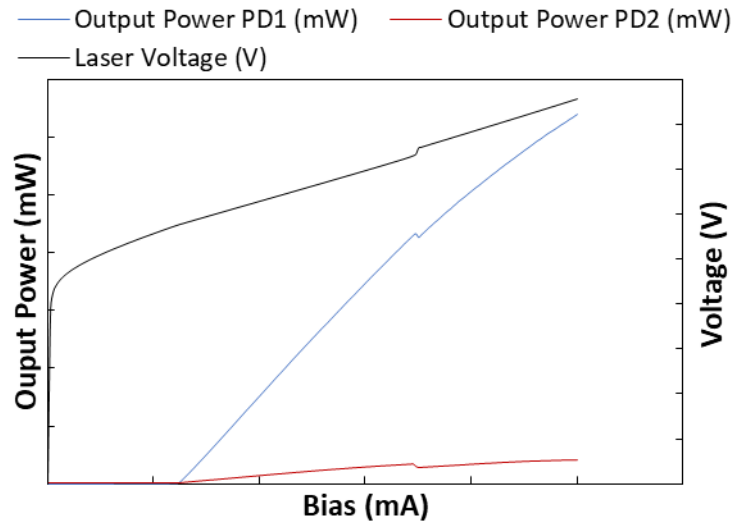
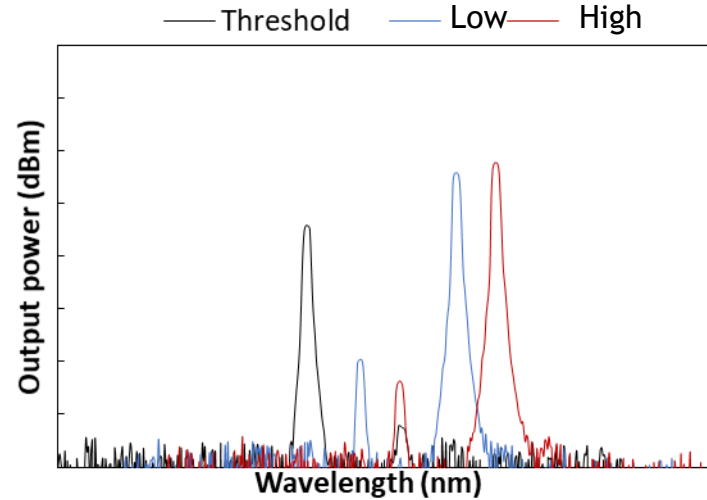
DC Characteristics

- 3 main graphs produced:
 - LIV (light-current-voltage)
 - EAM absorption curve
 - Spectrum
- Significant parameters:
 - Output power
 - On/off ratio
 - Threshold current
 - Wavelength at threshold
 - Side Mode Suppression Ratio



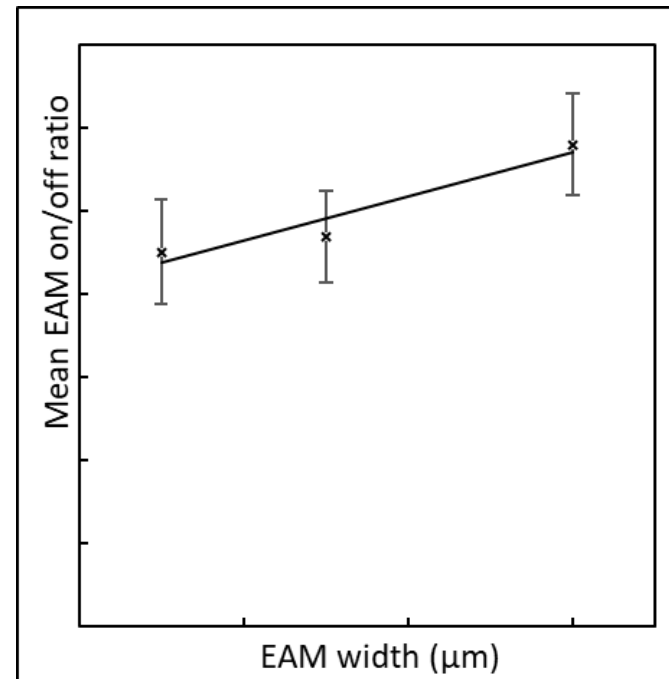
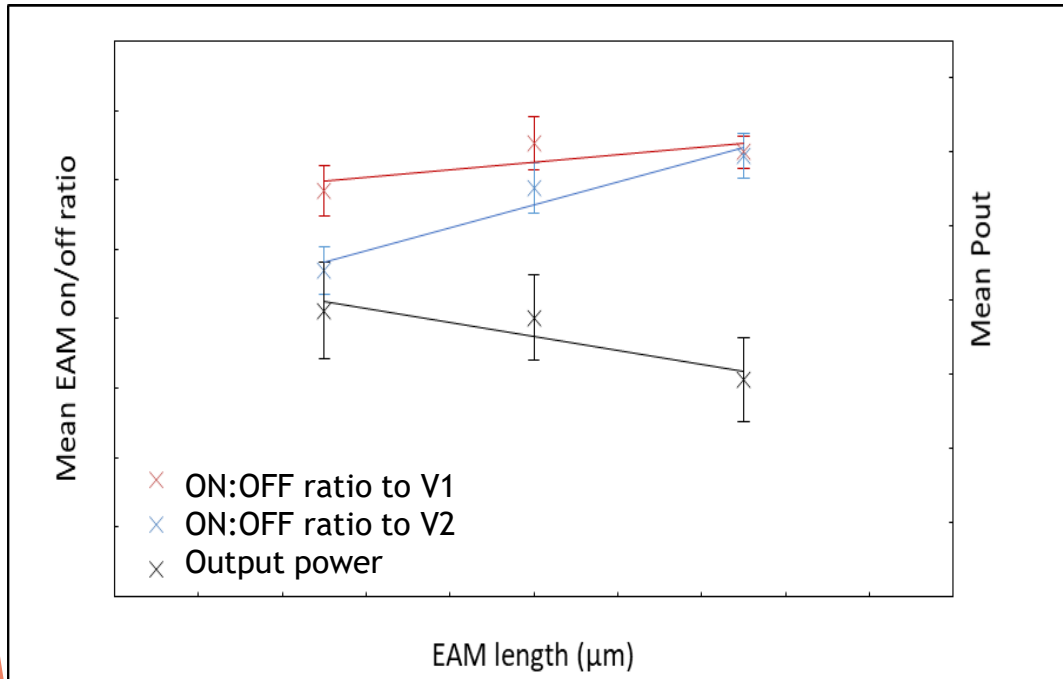
DC Characteristics- failure modes

- Failure modes:
 - Mode hopping
 - Thermal roll-over
 - Kinks
 - Intermittent contact

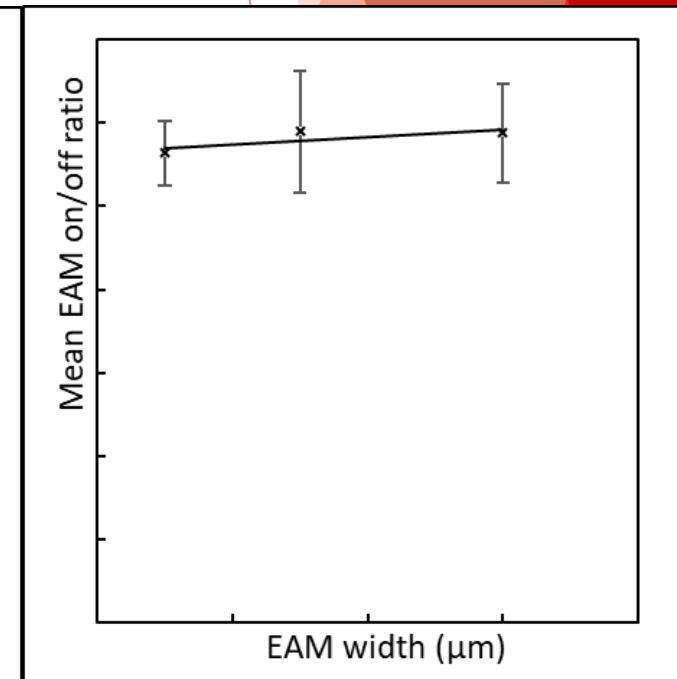


DC Characteristics- Statistical Analysis of Experimental Results

- Labview program for analysis
- Investigated various lengths and widths of EAM



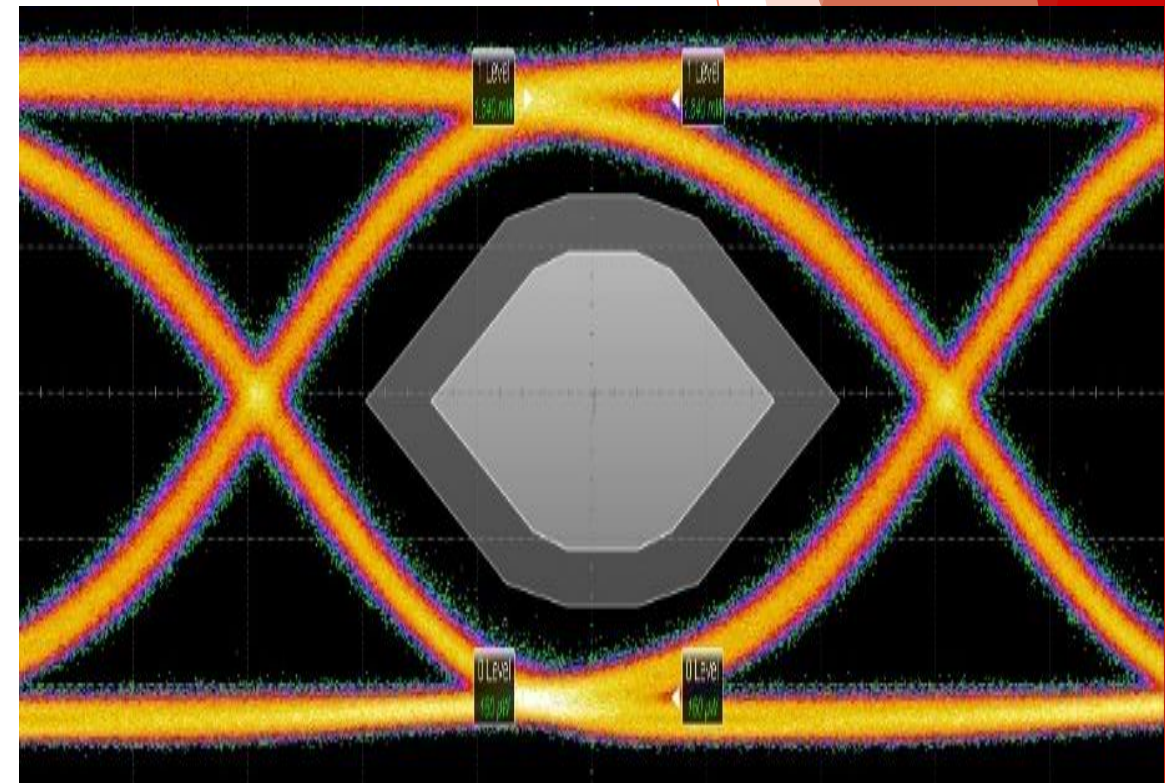
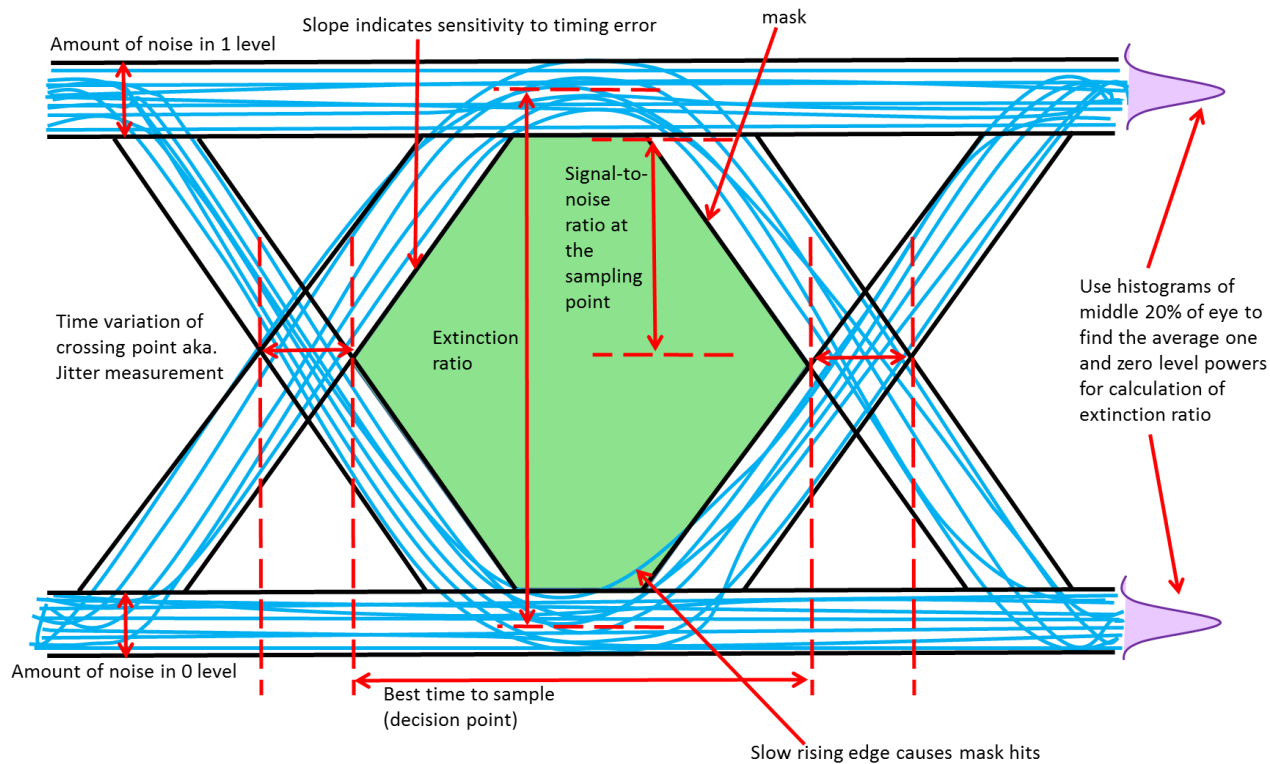
Shorter EAM



Longer EAM

High-Speed Characteristics

- Collected 'eye diagrams'
- RF signal sent through device and output waveform measured
- Quality of transmission determined

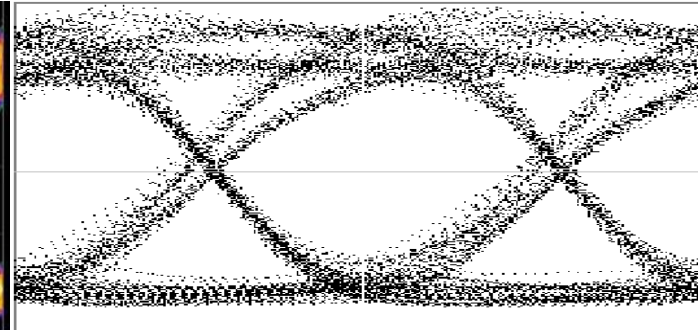
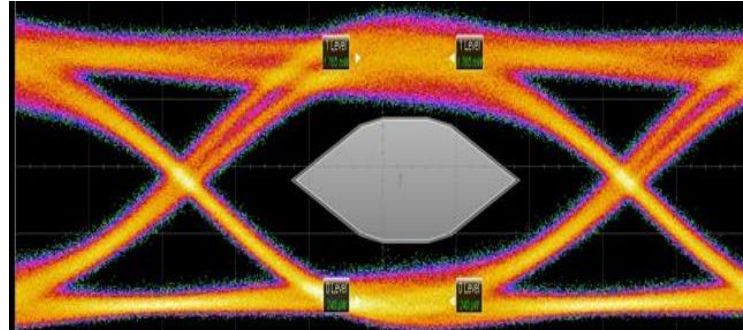


High-Speed Characteristics- PICWAVE simulations

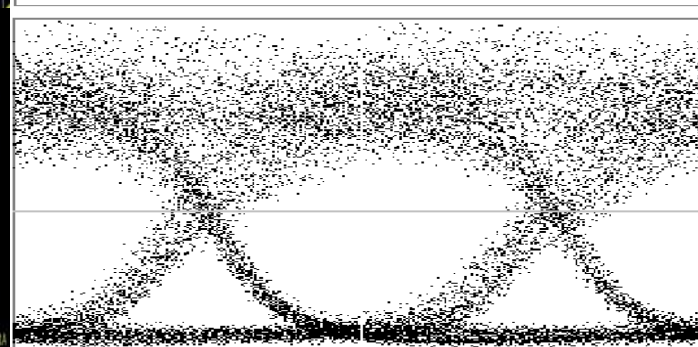
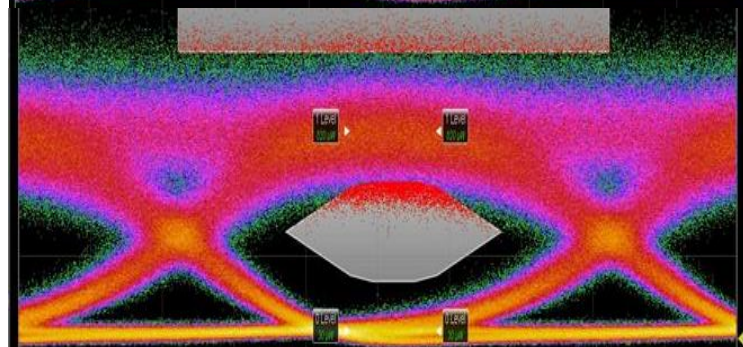
Experimental

Simulation

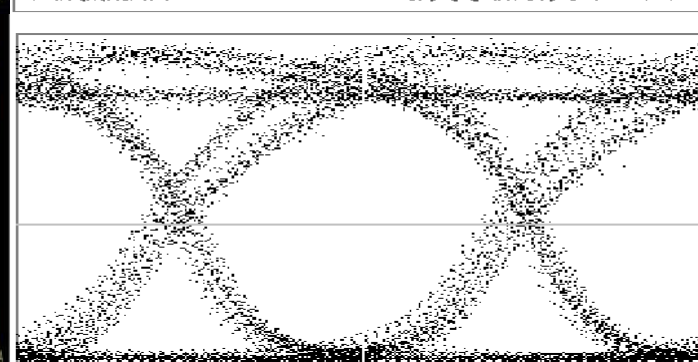
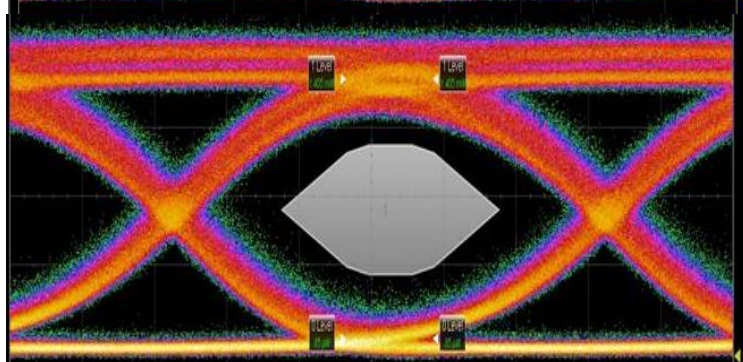
Ringling



Relative Intensity Noise (RIN)

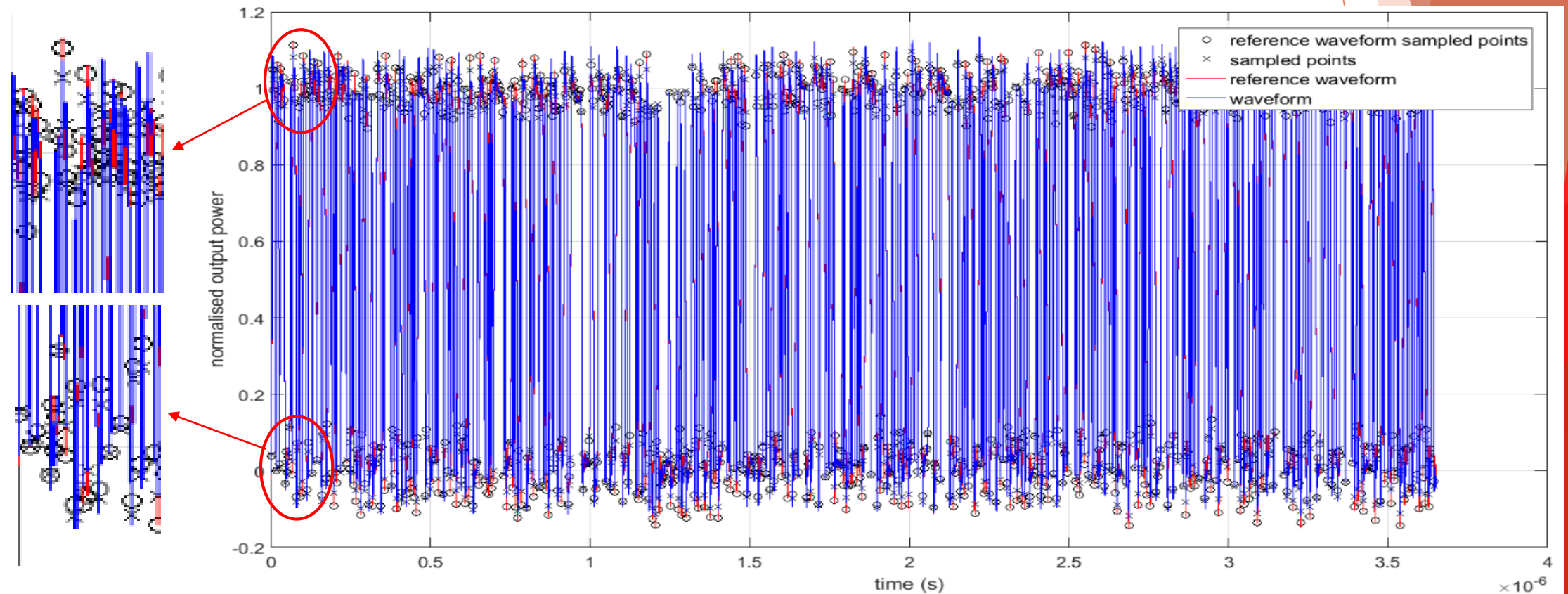


Saturation



High-Speed Characteristics- Matlab computational analysis

- Quantifies eye saturation



Future Work

- Development of higher-speed and longer-lifetime devices
- Continued investigation into saturation of eye diagrams
- Process waveforms through Matlab program

Working in Industry

- Attended weekly project & monthly whole staff meetings
- Working within a team towards deadlines
- 2 company projects
- Deciding which designs to develop further/ manufacture
- Confidentiality
- Laboratory & computational

The background features abstract, overlapping geometric shapes in various shades of red and orange, primarily concentrated on the right side of the frame. The shapes are semi-transparent, creating a layered effect. The text is centered on a white background.

Thank you!

Any questions?