

Measurements of Fiber Responses at 5Gb/s Data Rate Using 850nm VCSELs

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Overview

- **Measurements were taken using the procedure described in several presentations made at the January 2001 meeting of this Ad Hoc group (Irvine)**
- **Data rate was 5Gb/s, and sampling rate was 10GHz**
- **Real-time sampling**
- **Data interpolated to 25GHz or 100GHz by the oscilloscope**
- **10Gb/s VCSEL module from Tellium Corporation**
- **Speed limited by the oscilloscope, not the laser, photodetector or BERT**

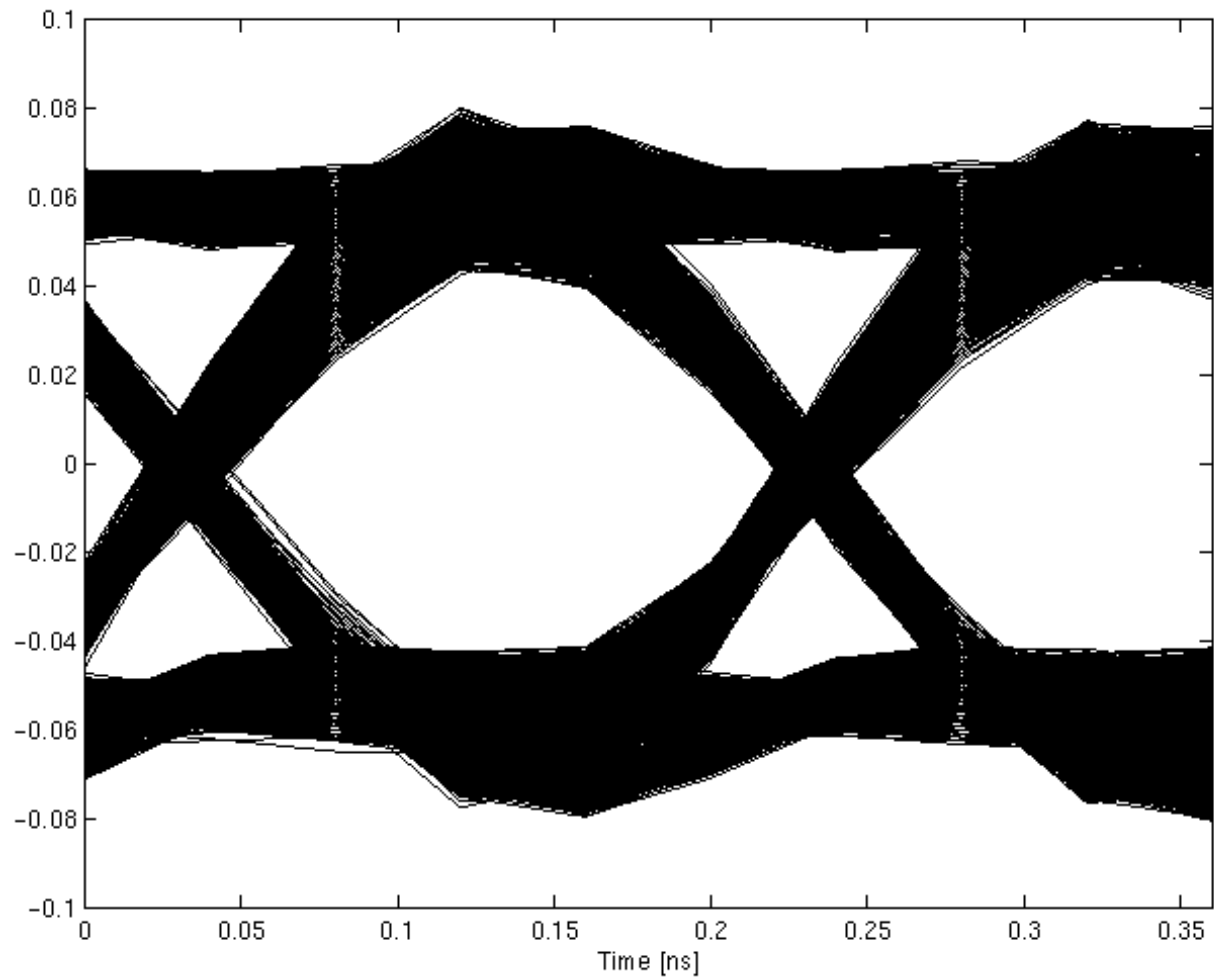


Table of Measured Fibers

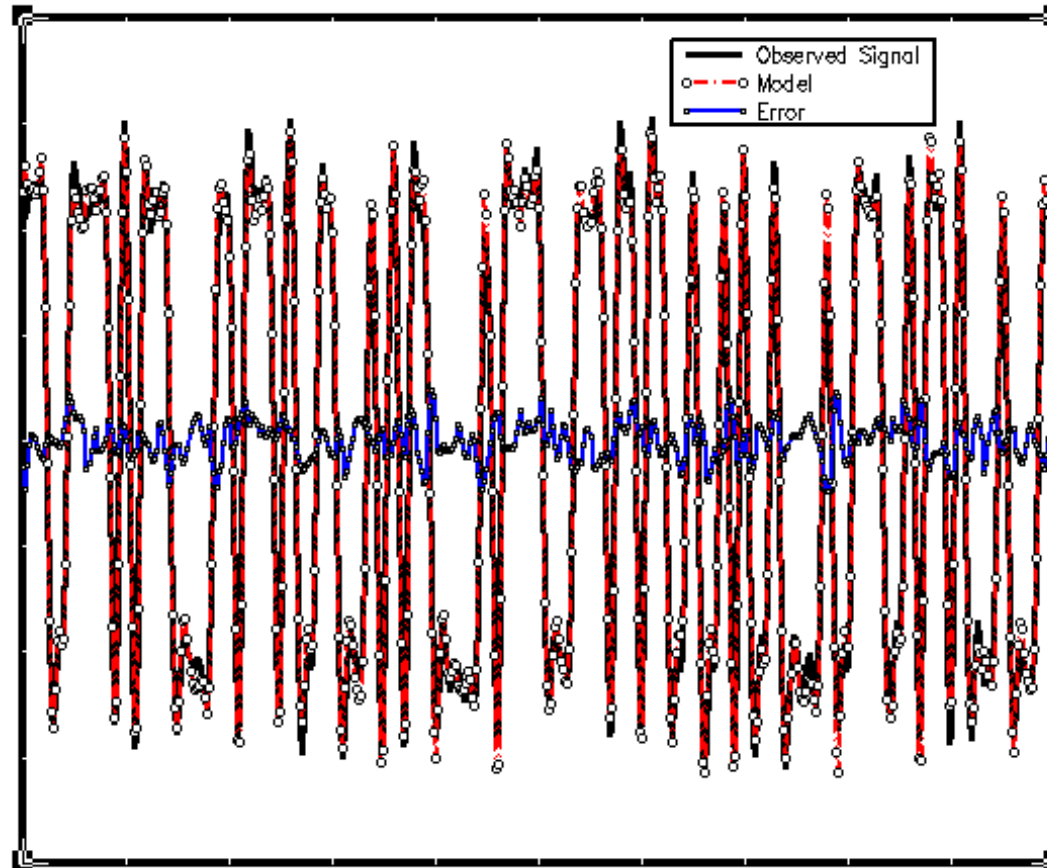
CASE	FIBER	LENGTH[m]	SOURCE
1	Short Fiber	5	Corning
2	DEC No.1	150	TIA/Compaq
3	Fujikura No.1	300	TIA/Raytheon
4	Fujikura No.2	270	Broadcom



Eye Pattern for Non-Equalized System (Case 1)



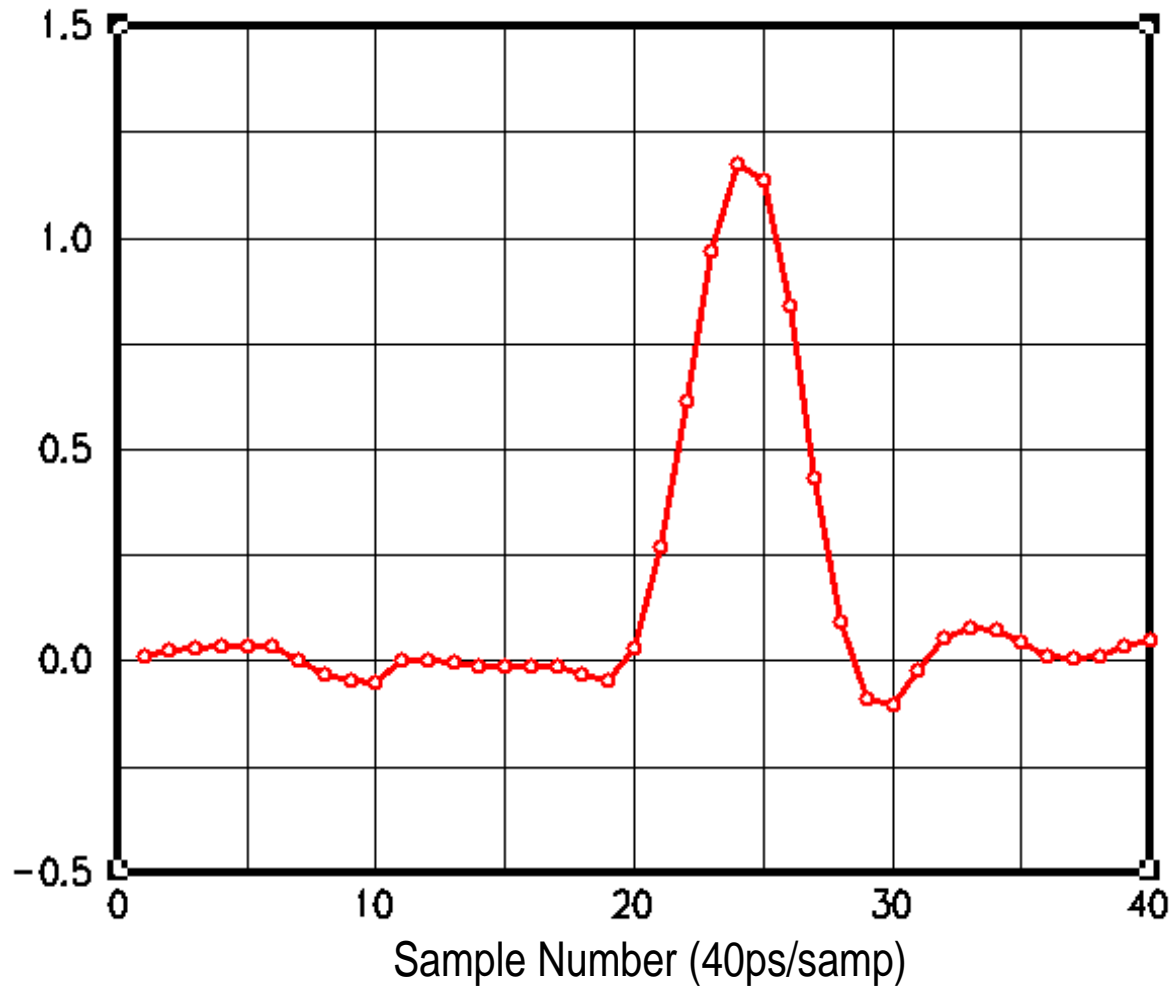
Measured Signal vs. Model and Error (Case 1)



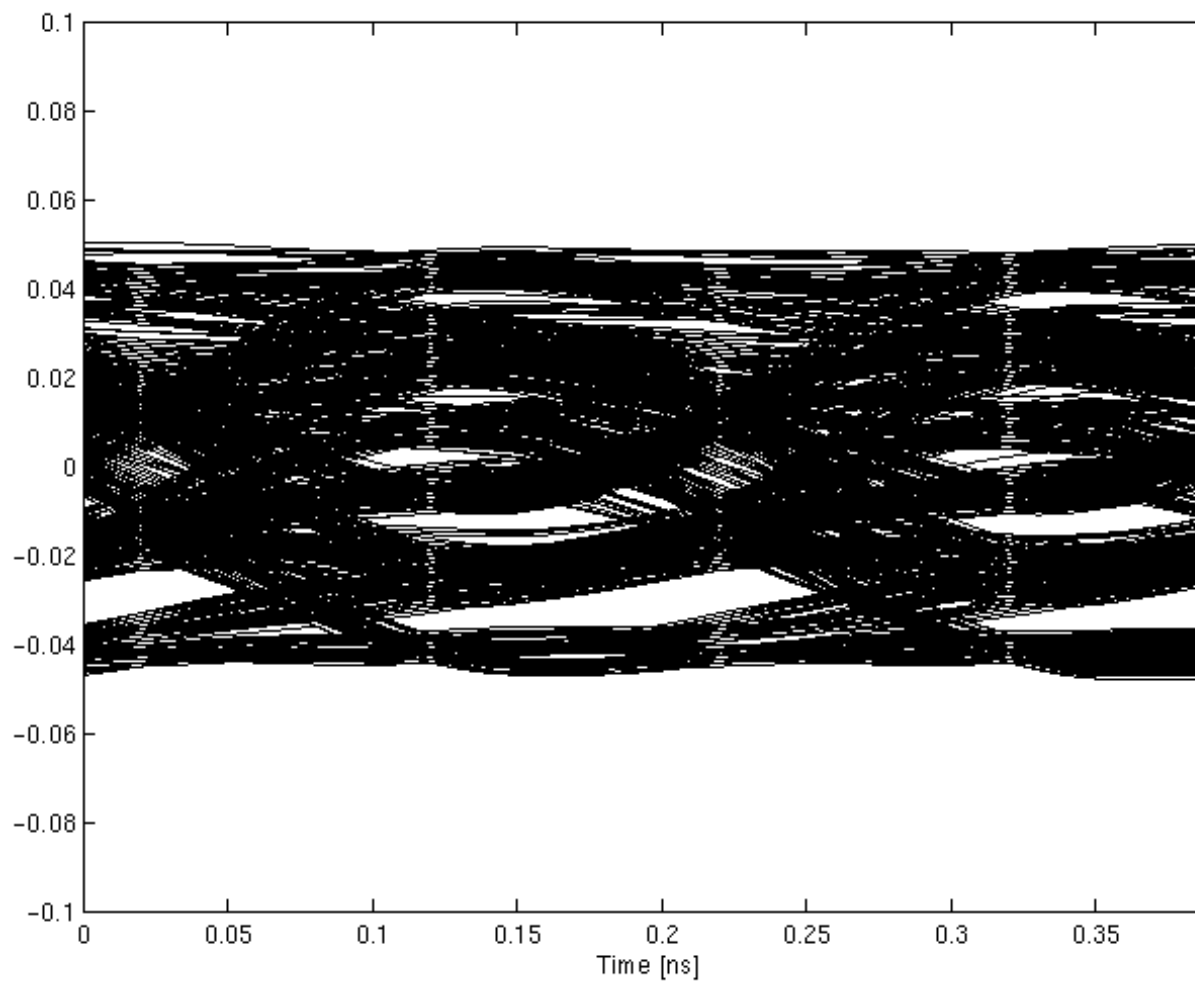
Bit Rate = 5Gb/s, Sampling Rate = 10GHz (interpolated to 25GHz)



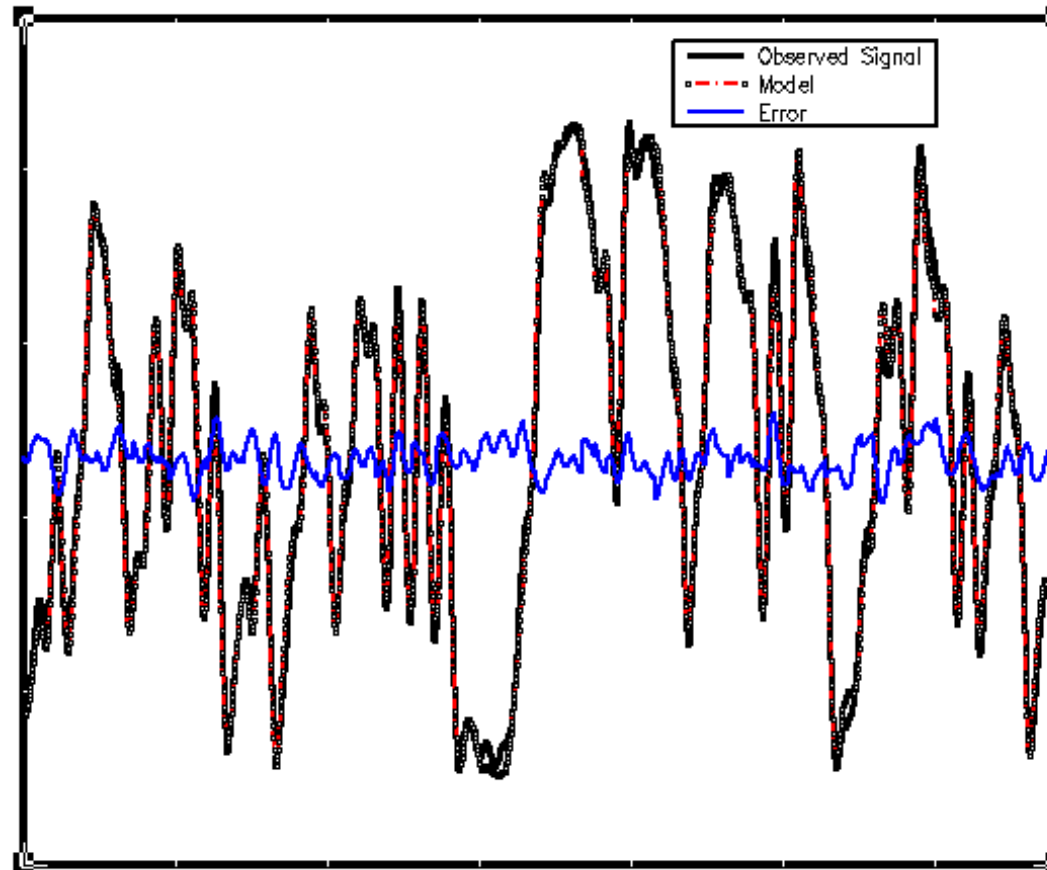
Impulse Response (Case 1)



Eye Pattern for Non-Equalized System (Case 2)



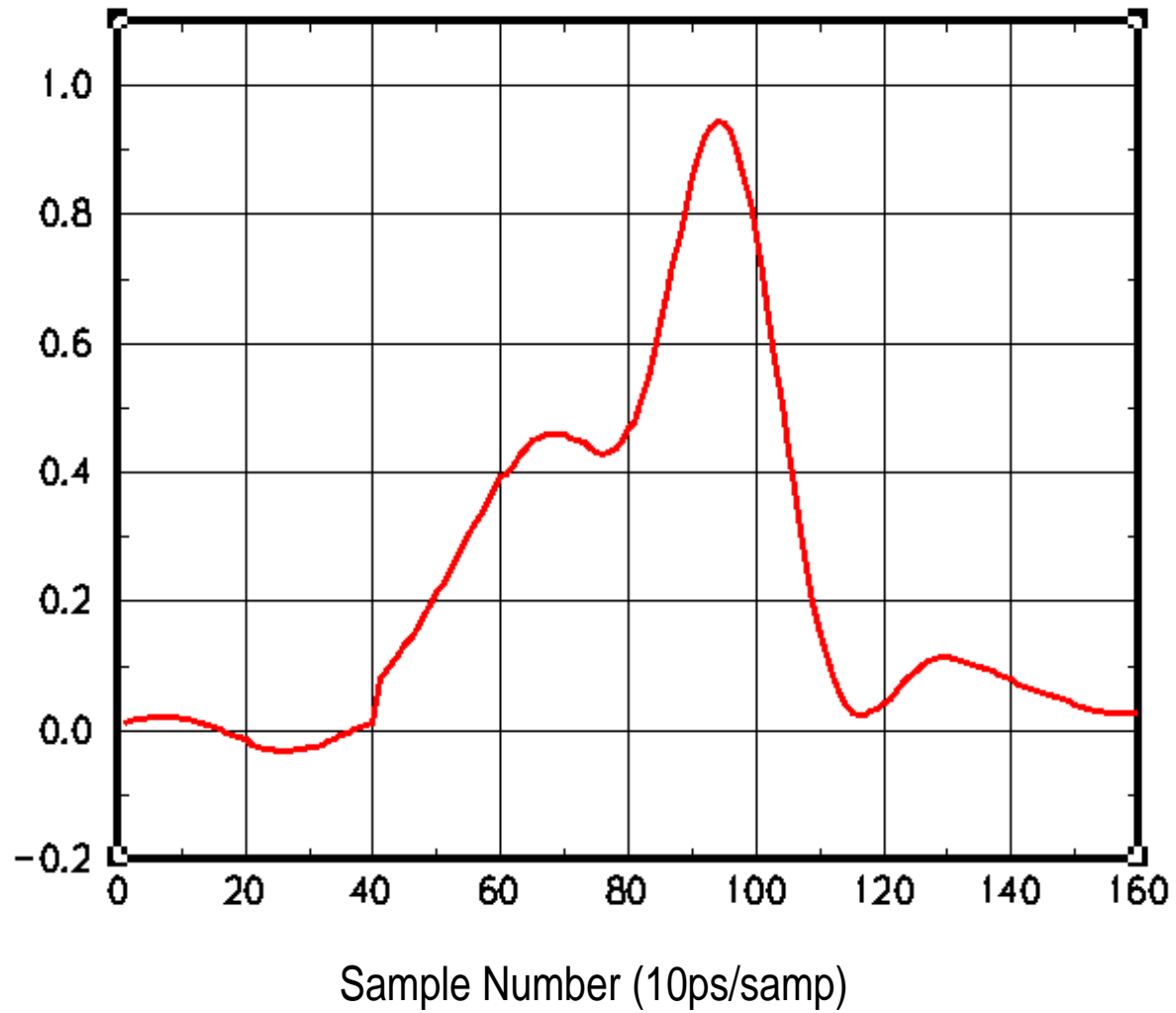
Measured Signal vs. Model and Error (Case 2)



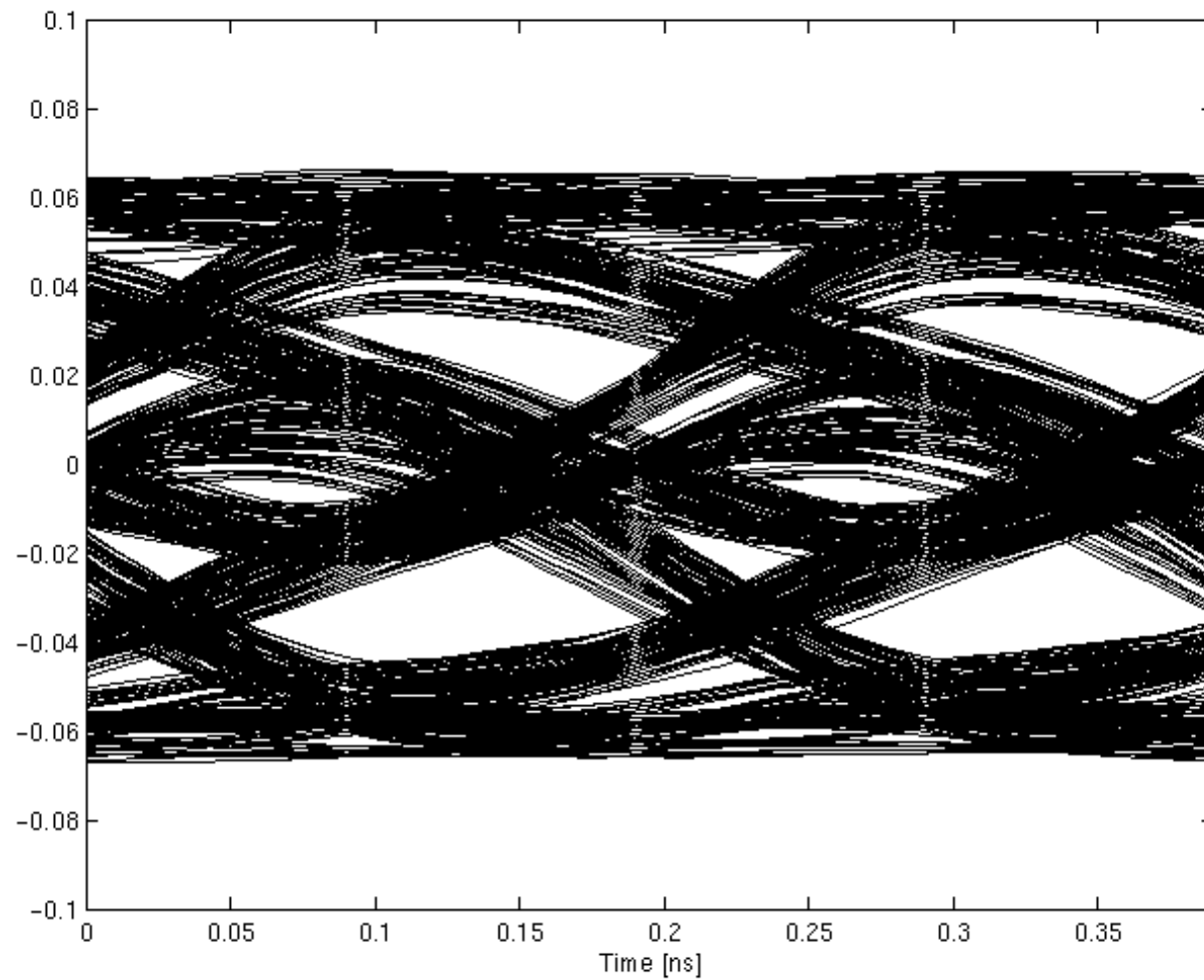
Bit Rate = 5Gb/s, Sampling Rate = 10GHz (interpolated to 100GHz)



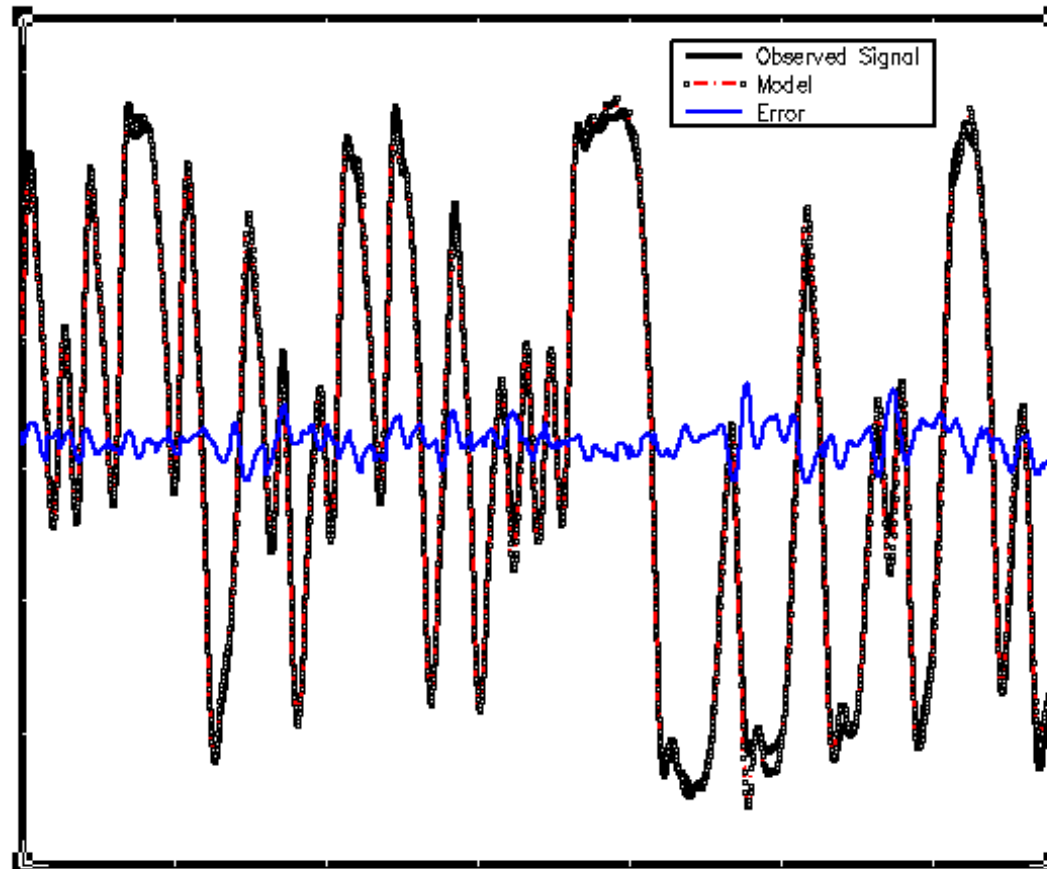
Impulse Response (Case 2)



Eye Pattern for Non-Equalized System (Case 3)



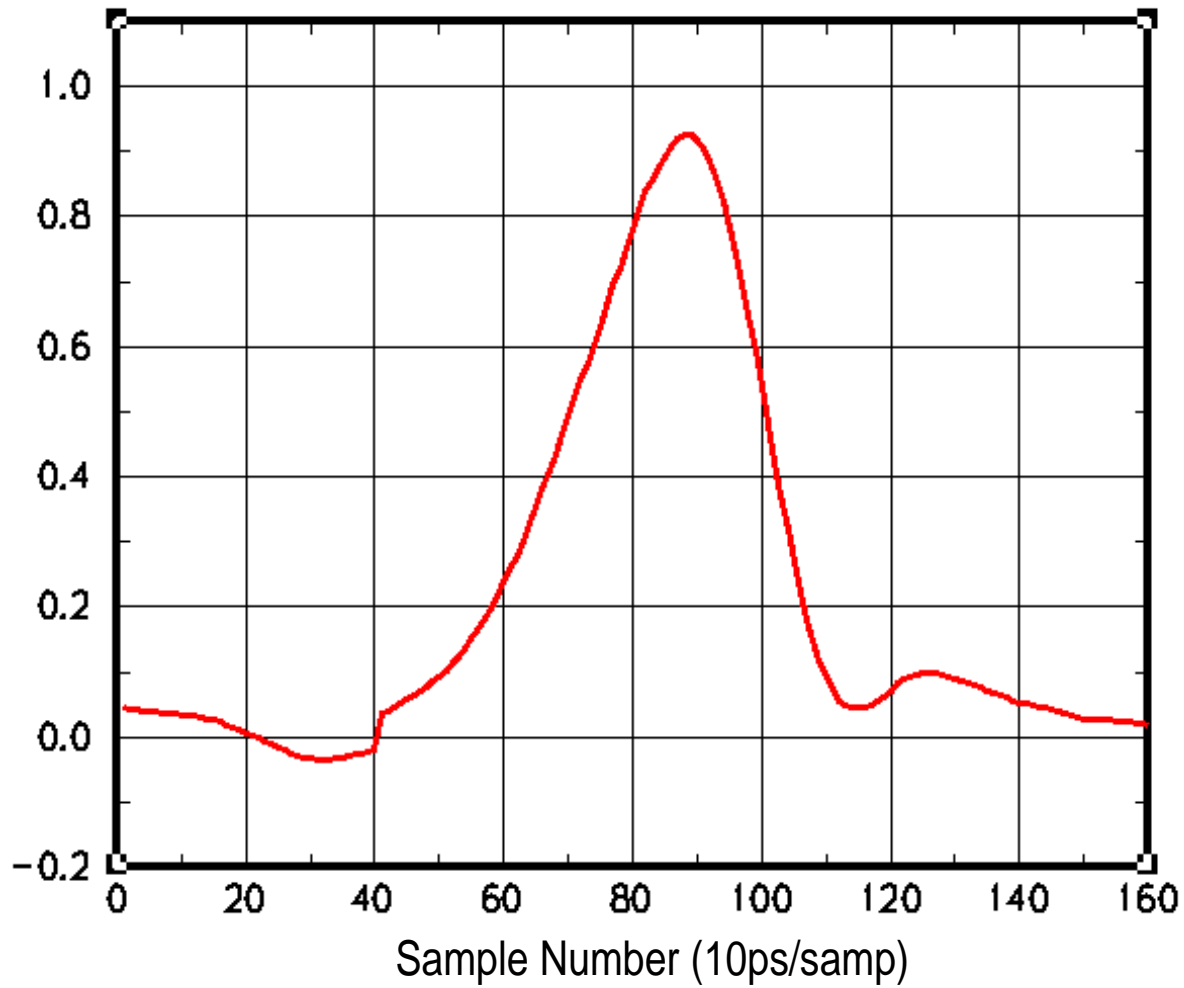
Measured Signal vs. Model and Error (Case 3)



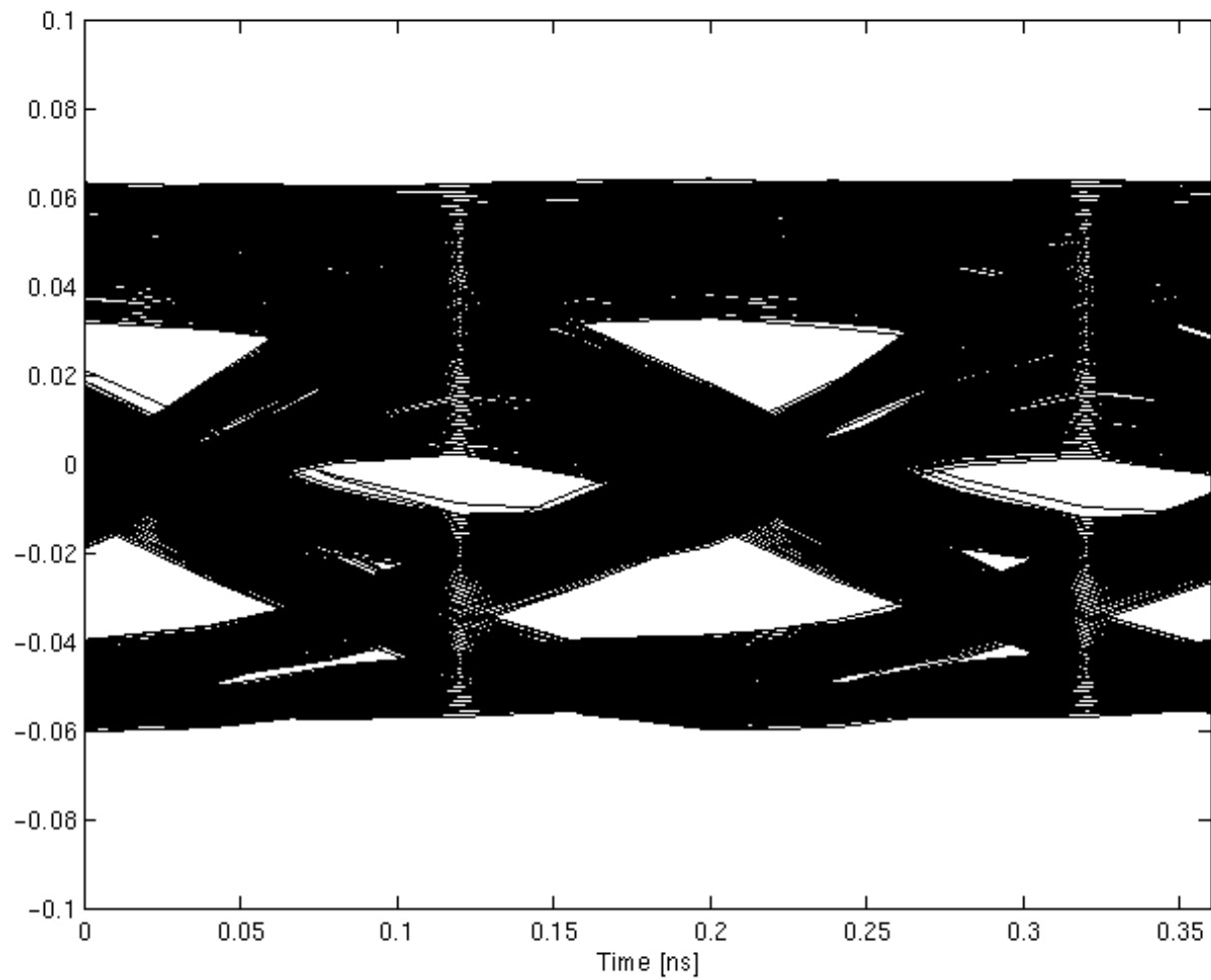
Bit Rate = 5Gb/s, Sampling Rate = 10GHz (interpolated to 100GHz)



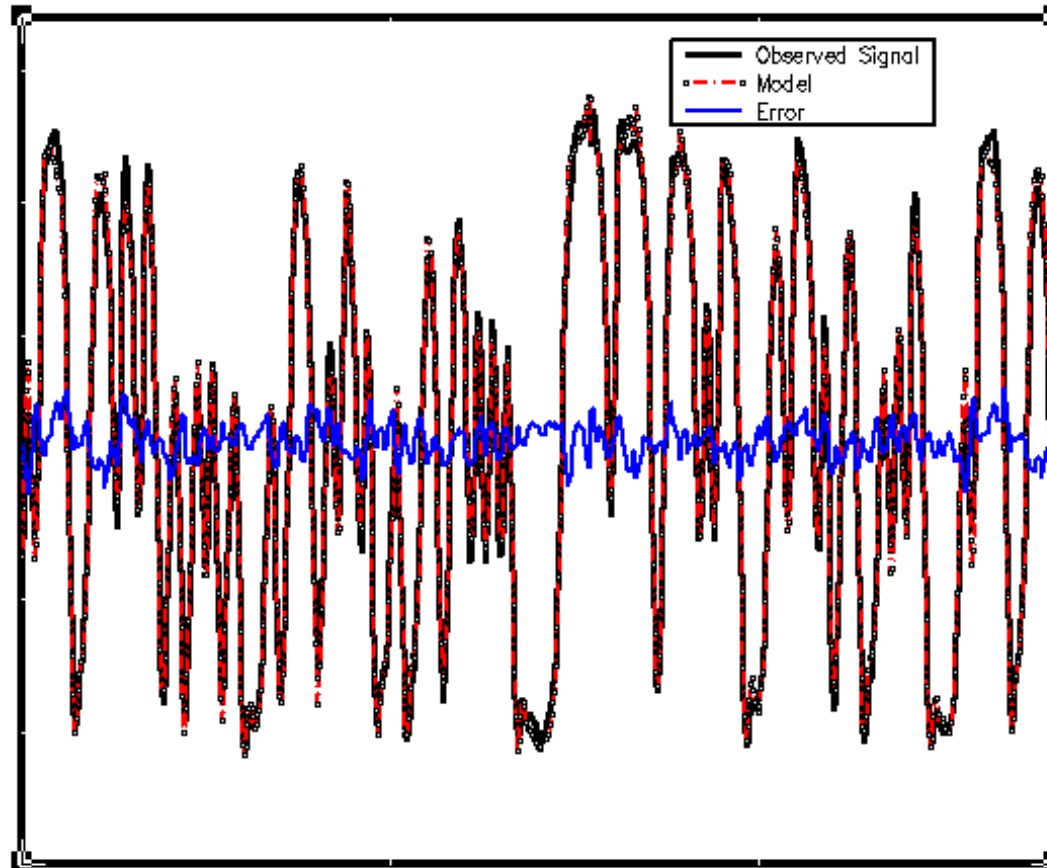
Impulse Response (Case 3)



Eye Pattern for Non-Equalized System (Case 4)



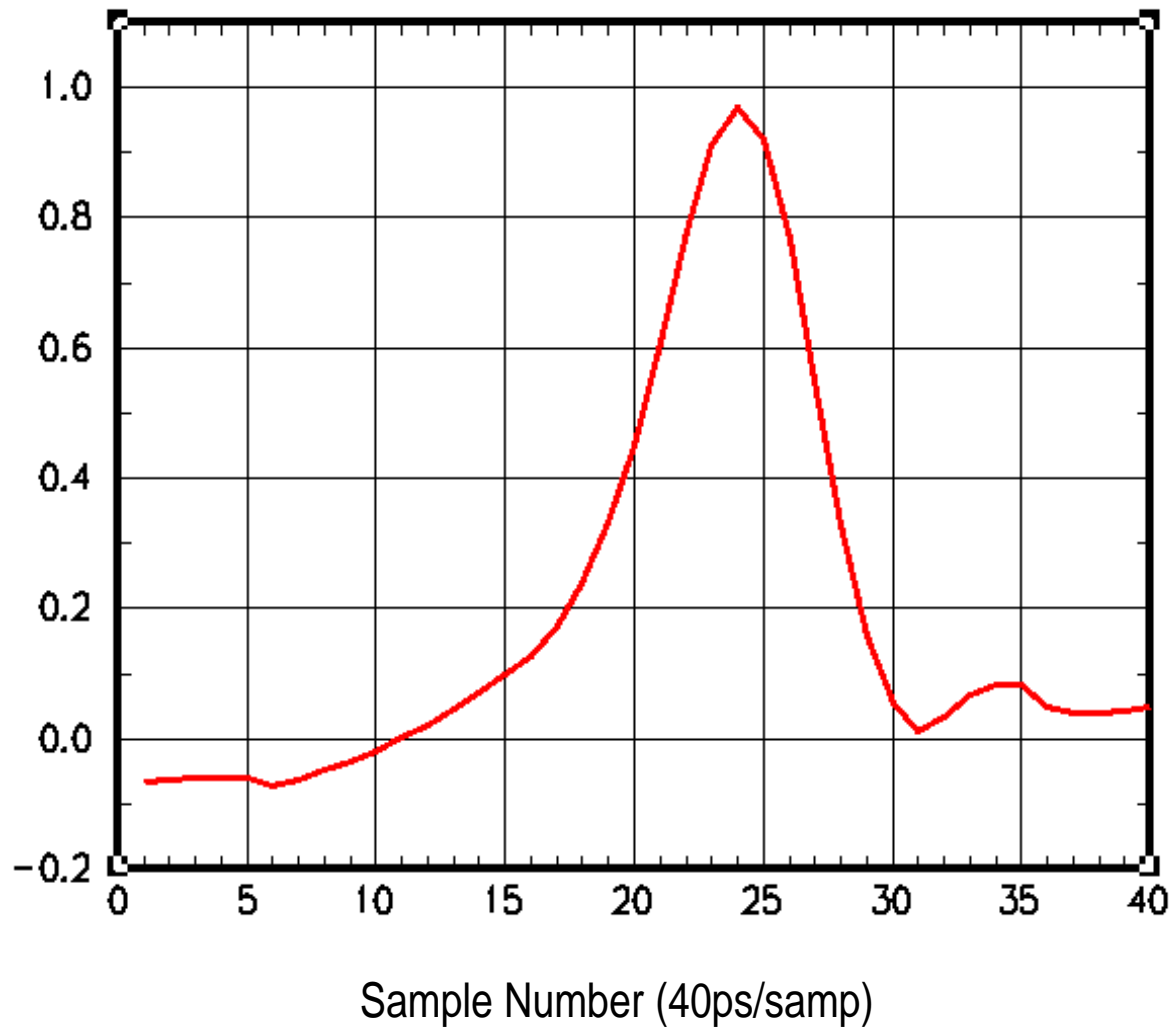
Measured Signal vs. Model and Error (Case 4)



Bit Rate = 5Gb/s, Sampling Rate = 10GHz (interpolated to 25GHz)



Impulse Response (Case 4)



Observed SNR

CASE	SNR[dB]
1	21.35
2	20.01
3	22.44
4	21.09



Conclusions

- **Linear adaptive model provided an excellent fit to the signals we measured at 5Gb/s using 850nm VCSELs**
- **Significant amounts of intersymbol interference and high SNRs were observed**



Acknowledgements

- **We would like to acknowledge Tellium Corporation for providing the 10Gb/s 850nm VCSEL module we used in these measurements**

