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Adaptive DFE Operating on Real World Data Stream

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Advanced Interface Technology Group





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Introduction

- **StatEye has been introduced and frequently referred to in the committee**

05-198R0 Harvey J. Newman

- **Work been done using StatEye to do link performance and budget analysis**

06-104R1 Yuriy Greshishchev and Galen Fromm

- **As an alternative to StatEye method, time domain DFE model could be used with certain advantages**



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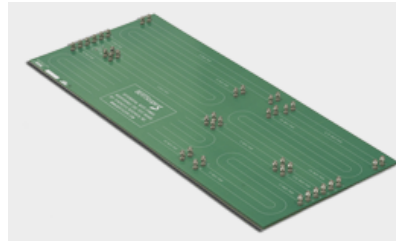
Experimental and Simulation Setup



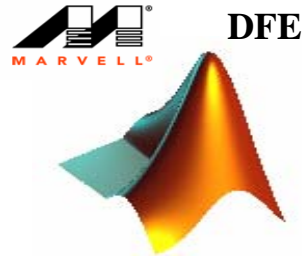
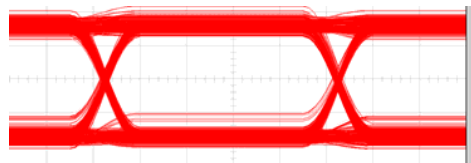
BertScope PRBS7 6 Gbps



Synthesis Research Backplane *



Lecroy SDA 6000



CDR + DFE in Simulink



* 06-258R0 BERTScope ISI Board Harvey Newman



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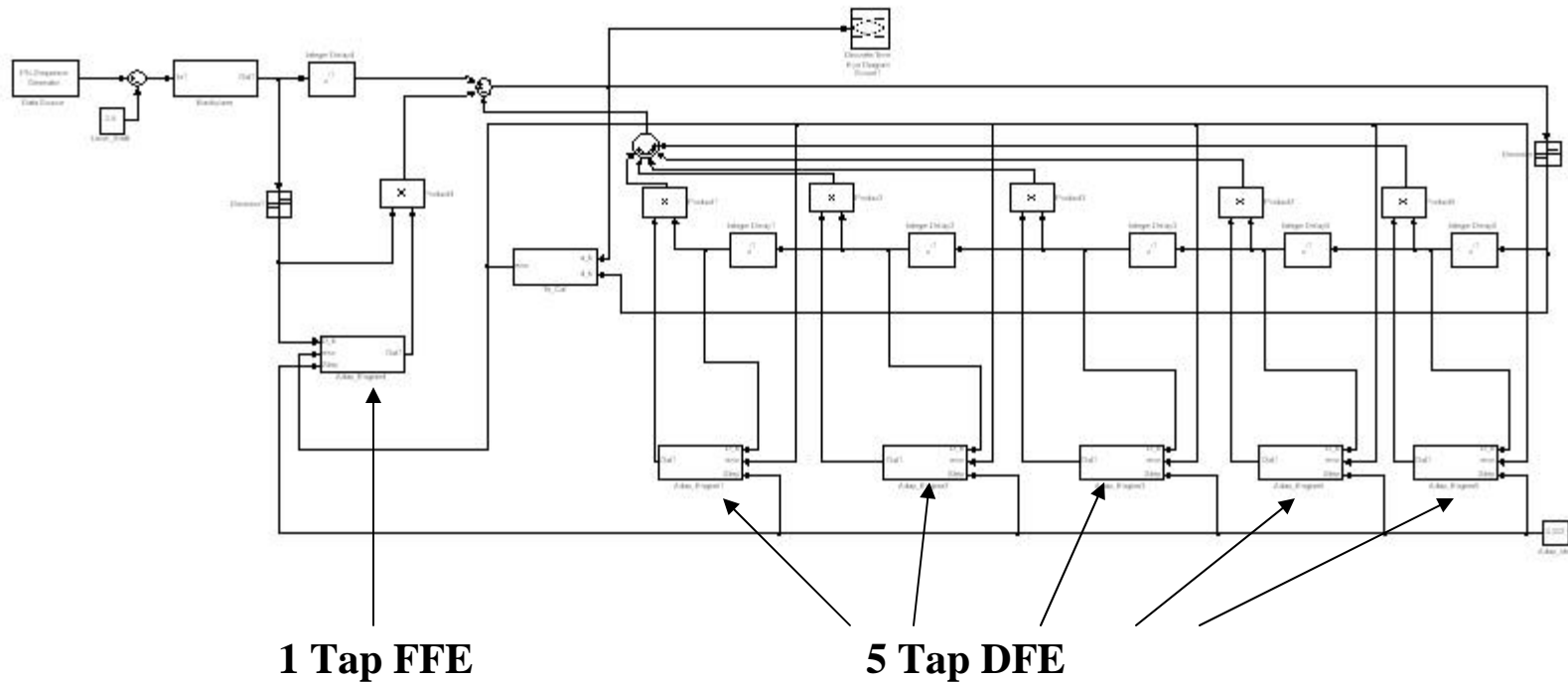


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5-Tap Adaptive DFE + 1-Tap Adaptive FFE





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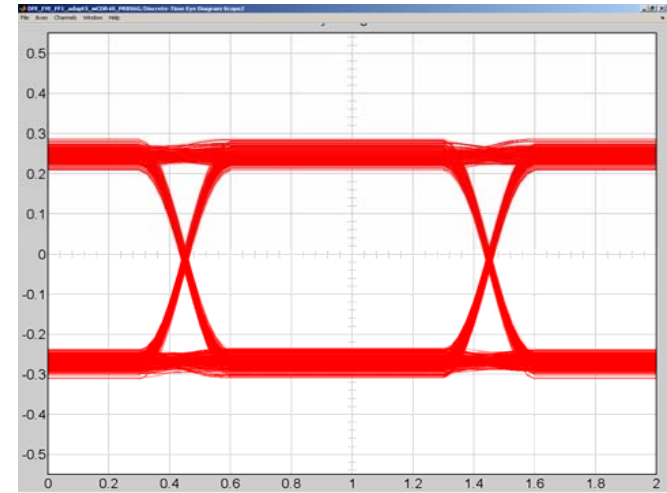
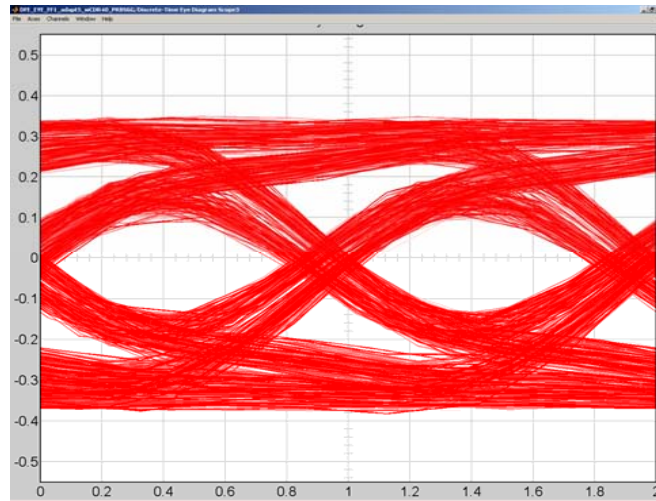
DFE operation on backplane long traces



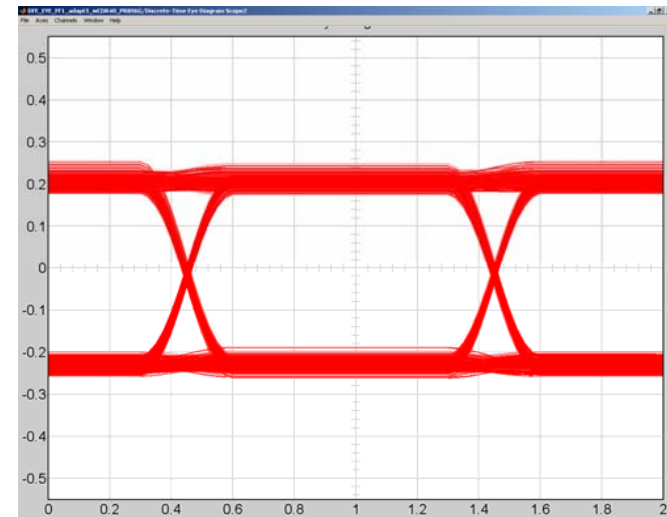
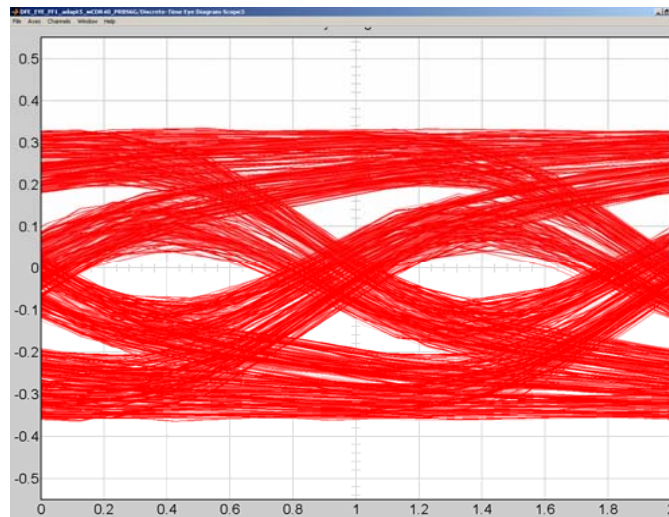
Pre DFE

Post DFE

31 inch



40 inch



DFE operation on backplane long traces



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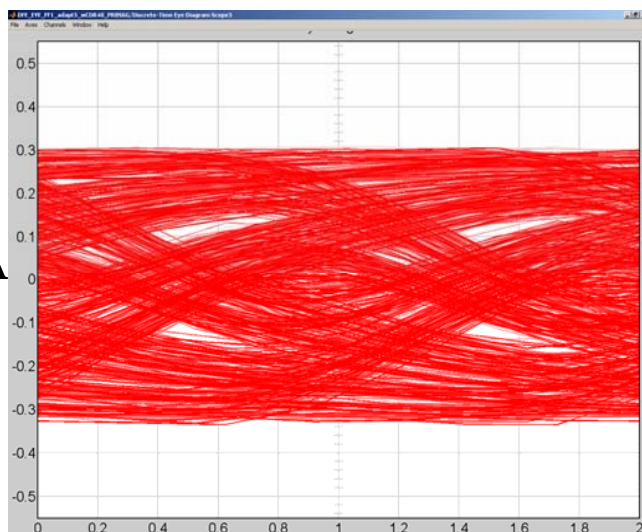


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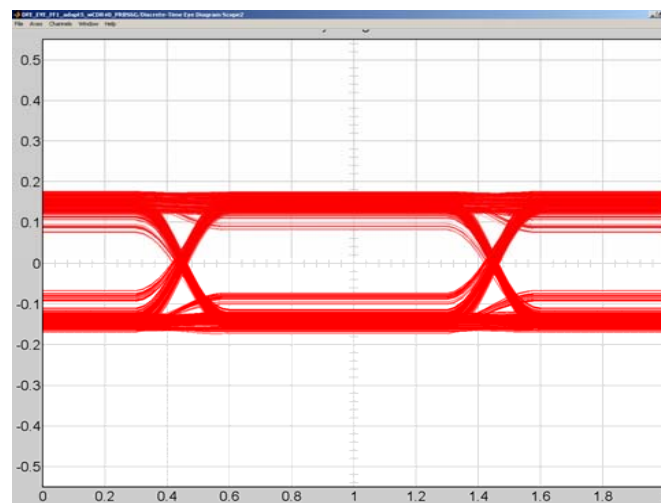
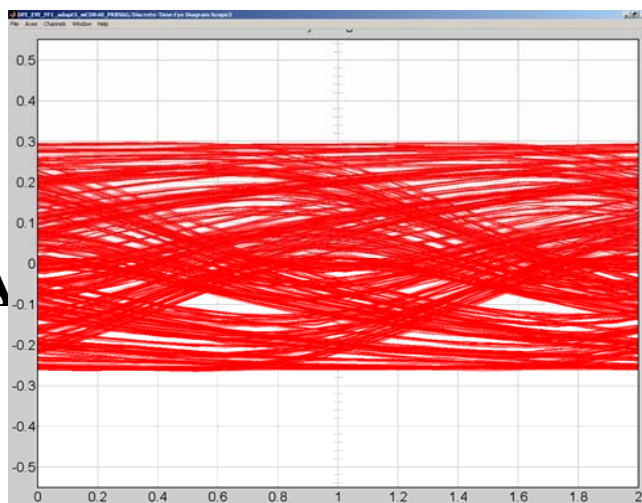
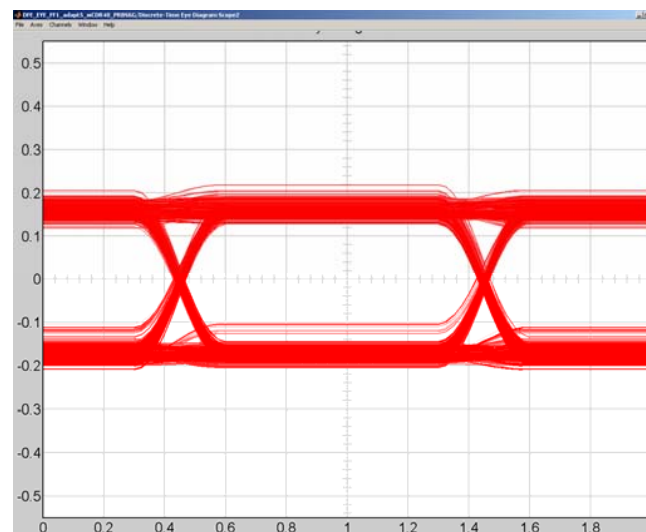
**40 inch +
1 feet SMA
Cable +
12 inch**

**40 inch +
1 feet SMA
Cable +
24 inch**

Pre DFE



Post DFE





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DFE Time domain approach



Compared with Stateye or other statistical method

- Provide direct correlation and comparison with scope capture
- Could easily be integrated with scope as an eye opening method
- Could easily be used to process any data captured by the scope
- More convenient for investigating “time related issues” such training sequence dependency, converging time etc
- All the built in functionality of the BERT like RJ/DJ could be easily leveraged for investigating DFE performance under real data traffic scenarios