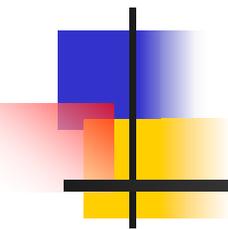


# 07-327r0 SAS-2 Compare Measured Data With Simulation Results

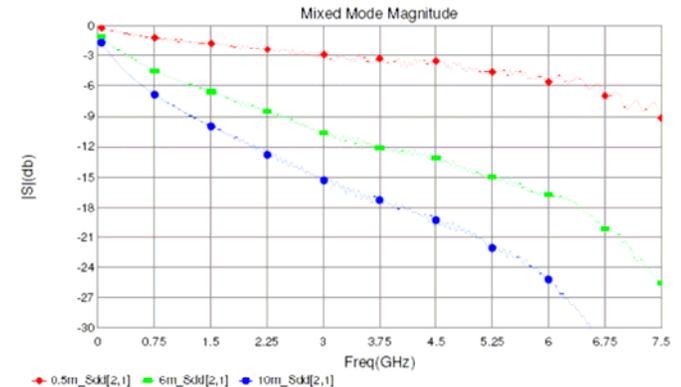


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Kevin Witt and Mahbubul Bari  
06/28/2007

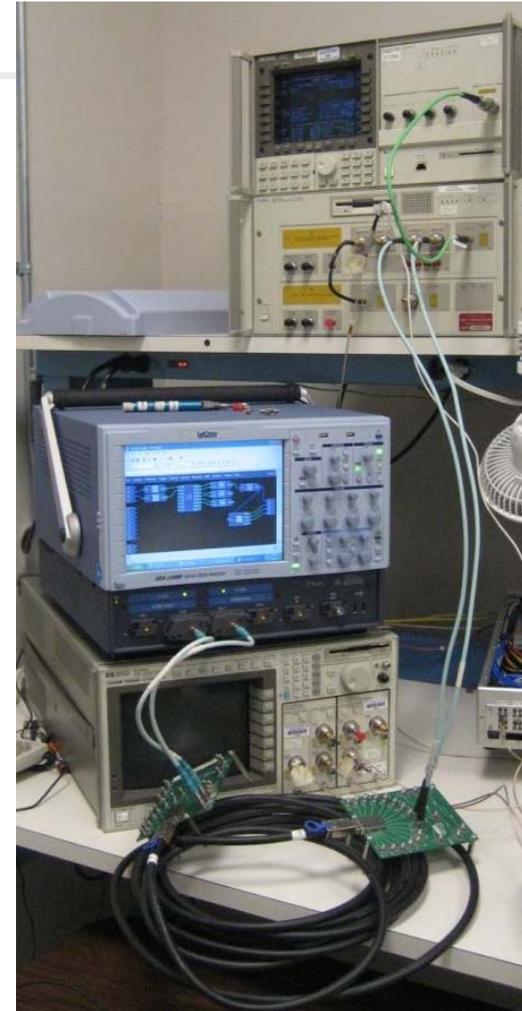
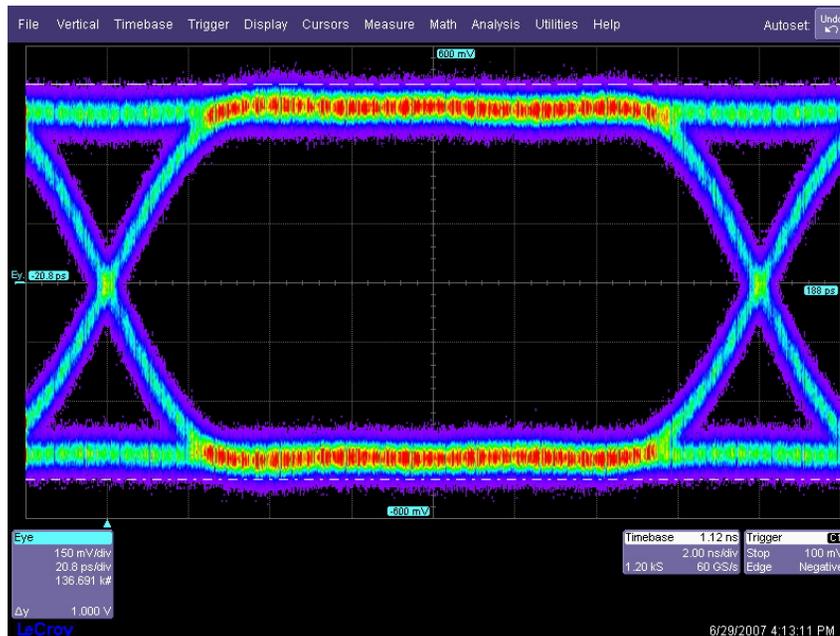
# Outline

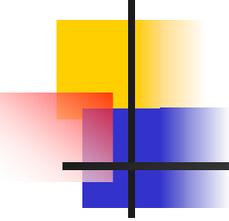
- Simulate With S-Parameter
  - Using StatEye
  - Using LeCroy's Virtual Probing
- Measure With Physical Channel
  - Use BERT Driving Physical Cable
- Compare Simulated Data With Measured



# Lab Setup

- PRBS  $2^{31}-1$  Launch Signal With 1V amplitude from Agilent 12G Pattern Generator
- Used 6m 24AWG and 0.5m 30AWG MiniSAS Cables





# StatEye Setup

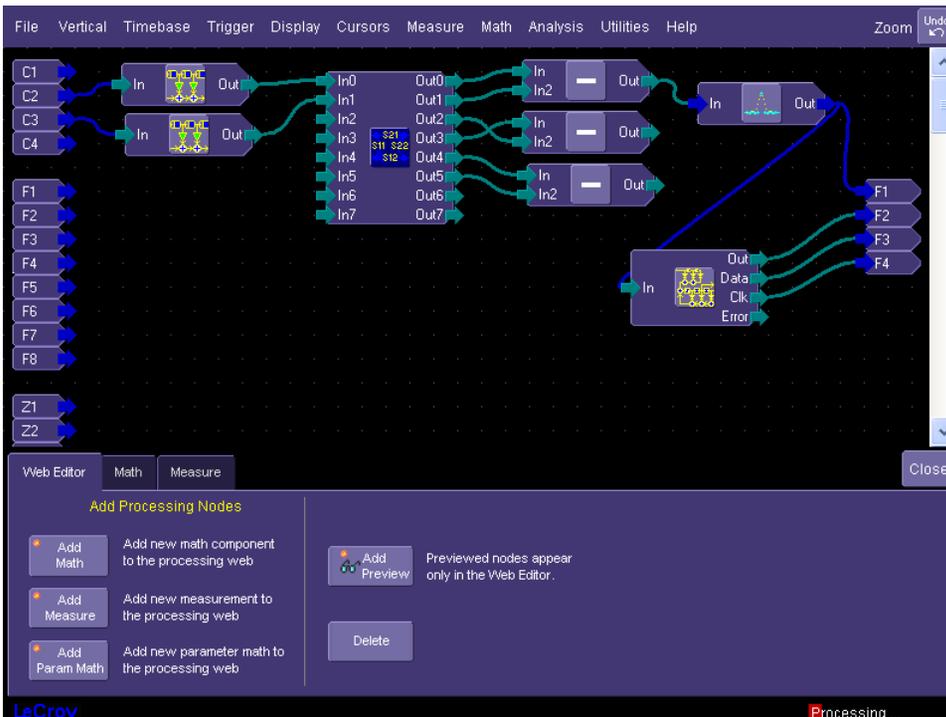
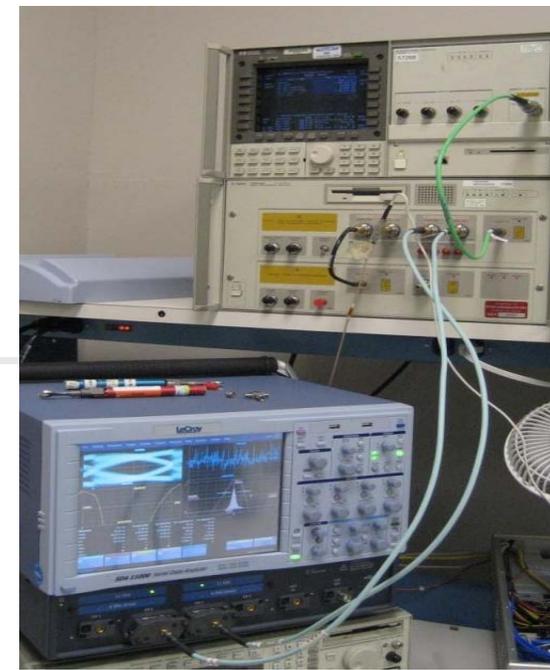
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- StatEye Setup

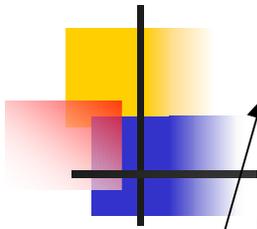
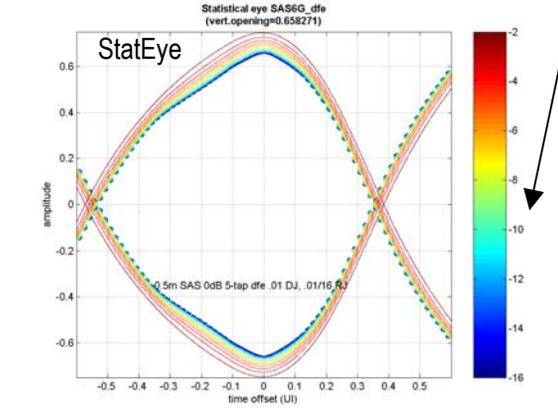
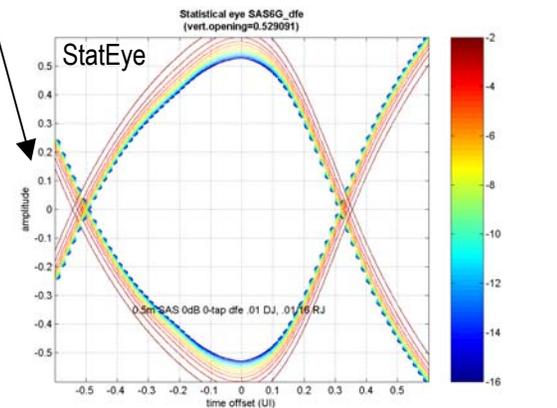
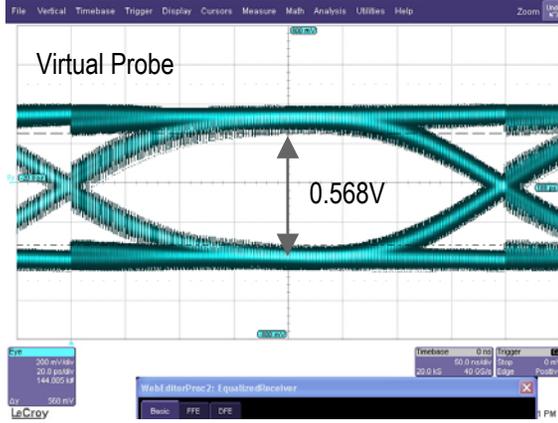
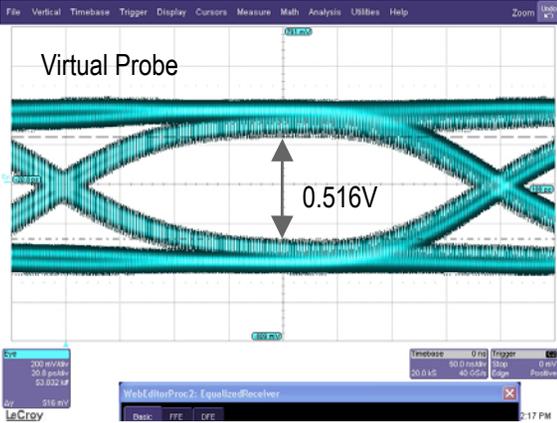
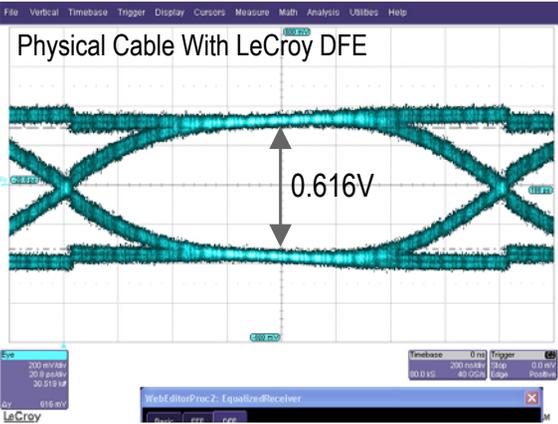
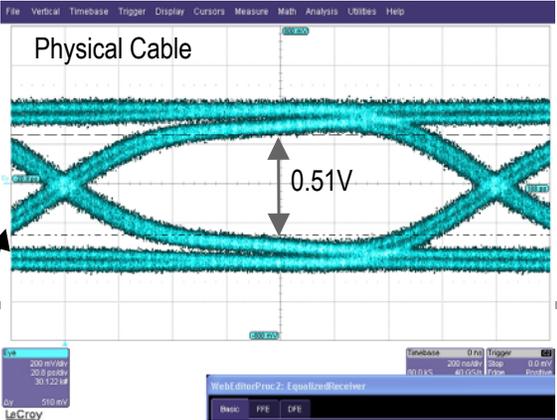
- 6Gbps
- 0dB De-Emphasis (1.0), Non-Optimized
- R/C Filters for Package Tx/Rx Model ( $r=45$ ,  $c=800\text{fF}$ )
- #<0,5> DFE Taps, CDR Disabled
- Jitter: DJ =  $0.01\text{UI}$ , RJ =  $0.01/(2*7.94)\text{ UI}$  (very low for comparison to PG only)

# Virtual Probing Setup

- 6G Signal from Agilent PG
- Used S-Parameter Models for 6m and 1/2 m MiniSAS Cables



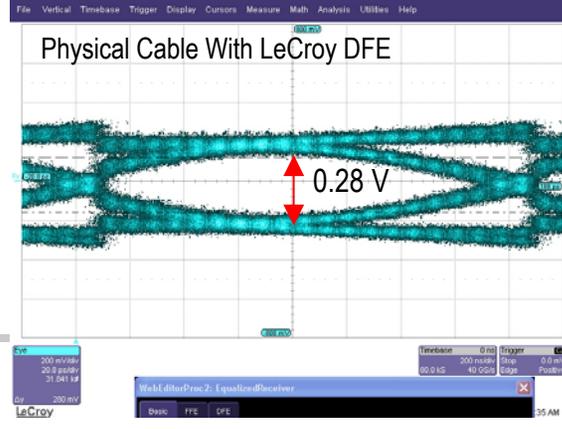
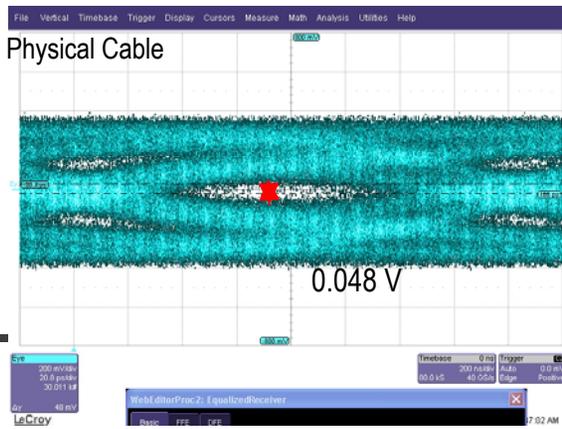
1/2 m 30AWG MiniSAS



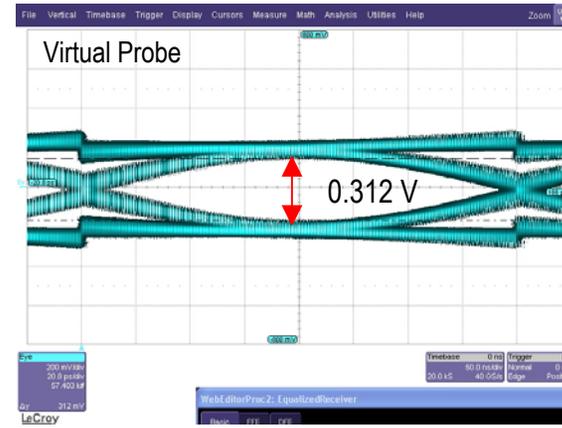
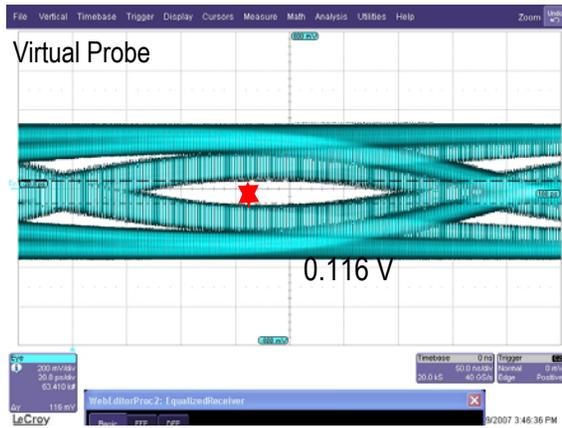
0 DFE

5 TAP DFE

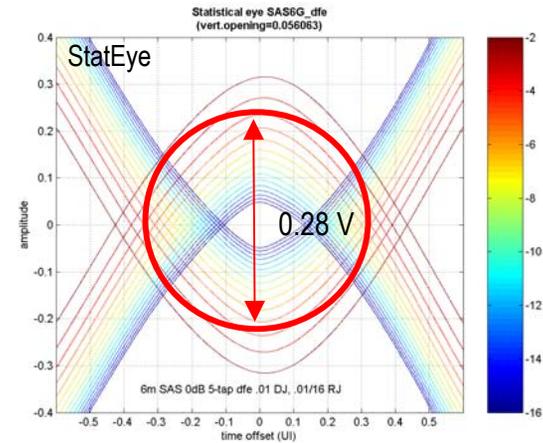
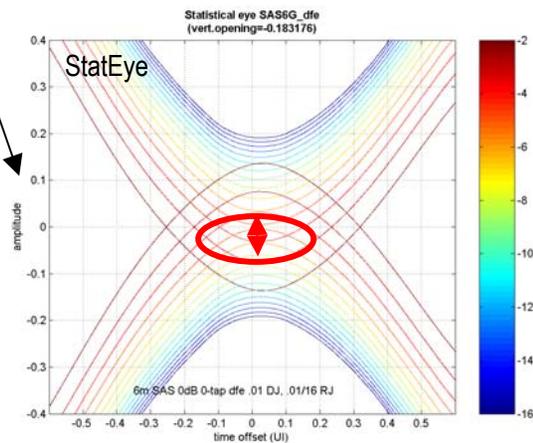
6 m 24AWG MiniSAS

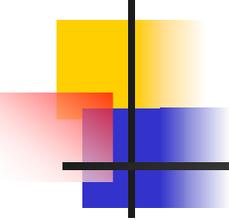


0 DFE



5 TAP DFE





## Summary

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- Good Correlation Between Virtual Probe and Physical Measurements
- Need To Understand StatEye Results
- Overall – Simulation is the right approach for SAS2