SAS-2 Short Interconnect Characterization (07-188r0)

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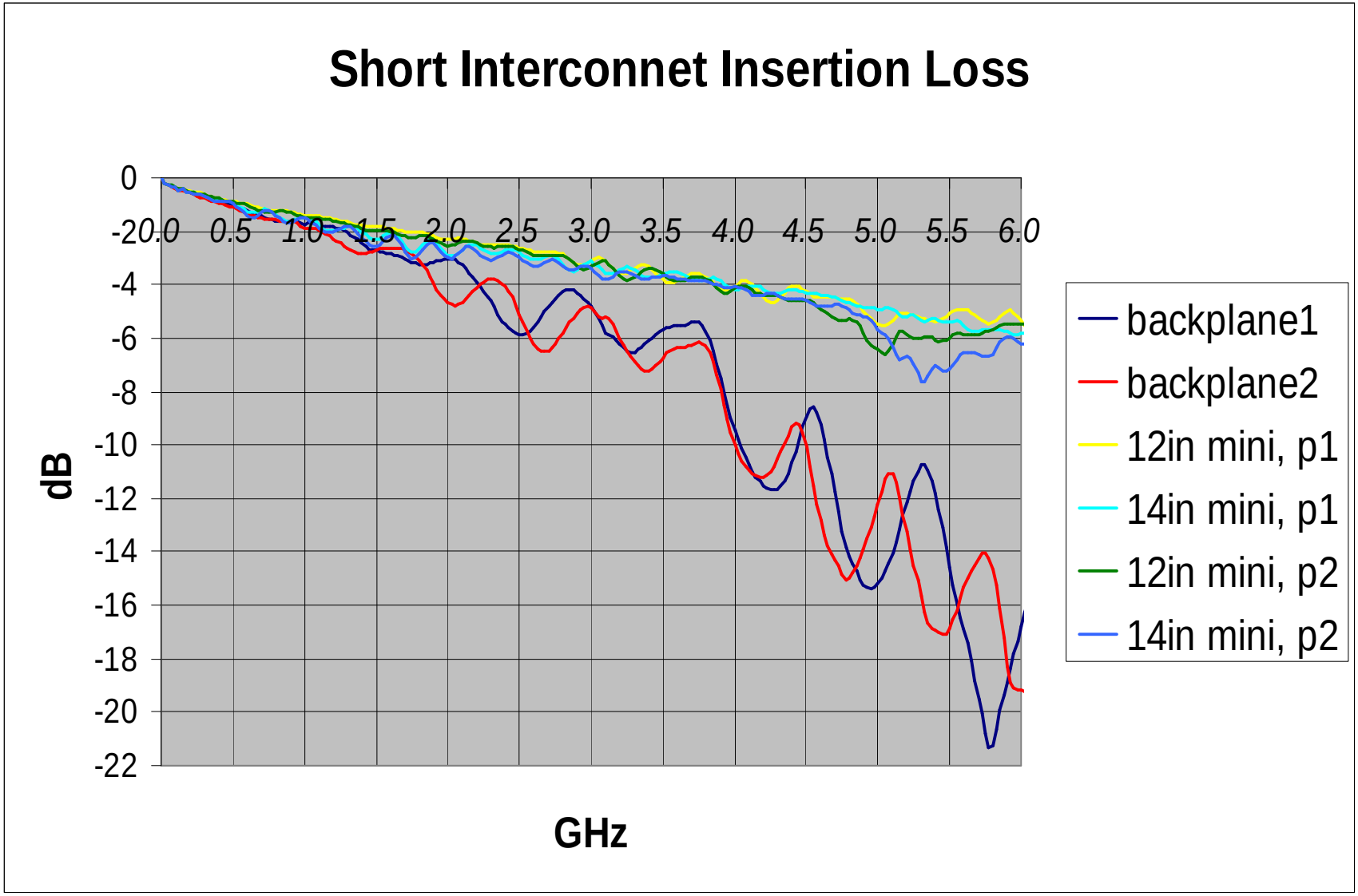
(4/17/2007)

Premise

- Interconnects with multiple impedance discontinuities separated by a low loss interconnect have proven problematic in certain situations
- Given such an interconnect, will pre-emphasis reduce signaling margins (amplitude or jitter)
- If so, how much margin is consumed

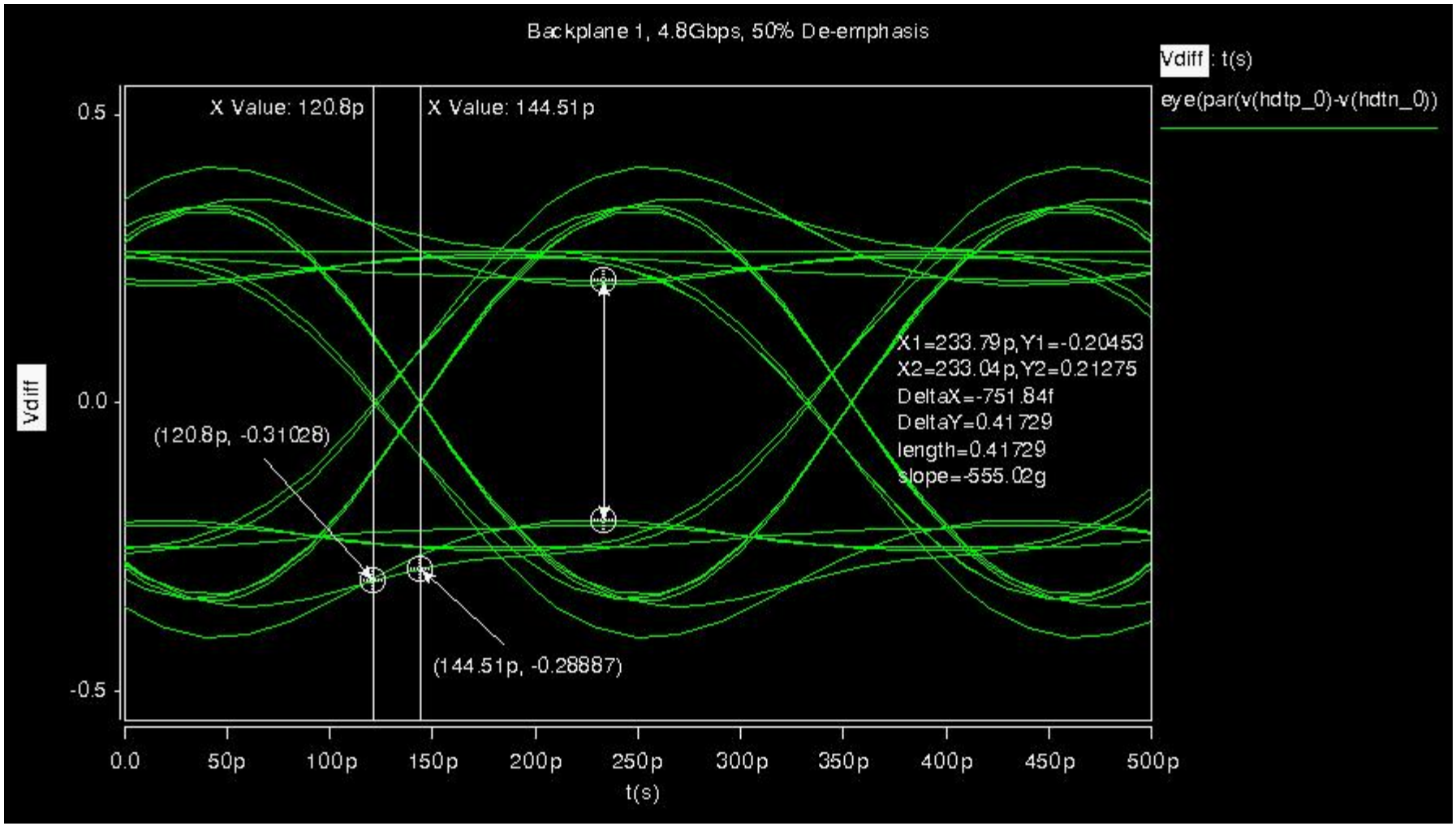
Short Interconnect Characterization



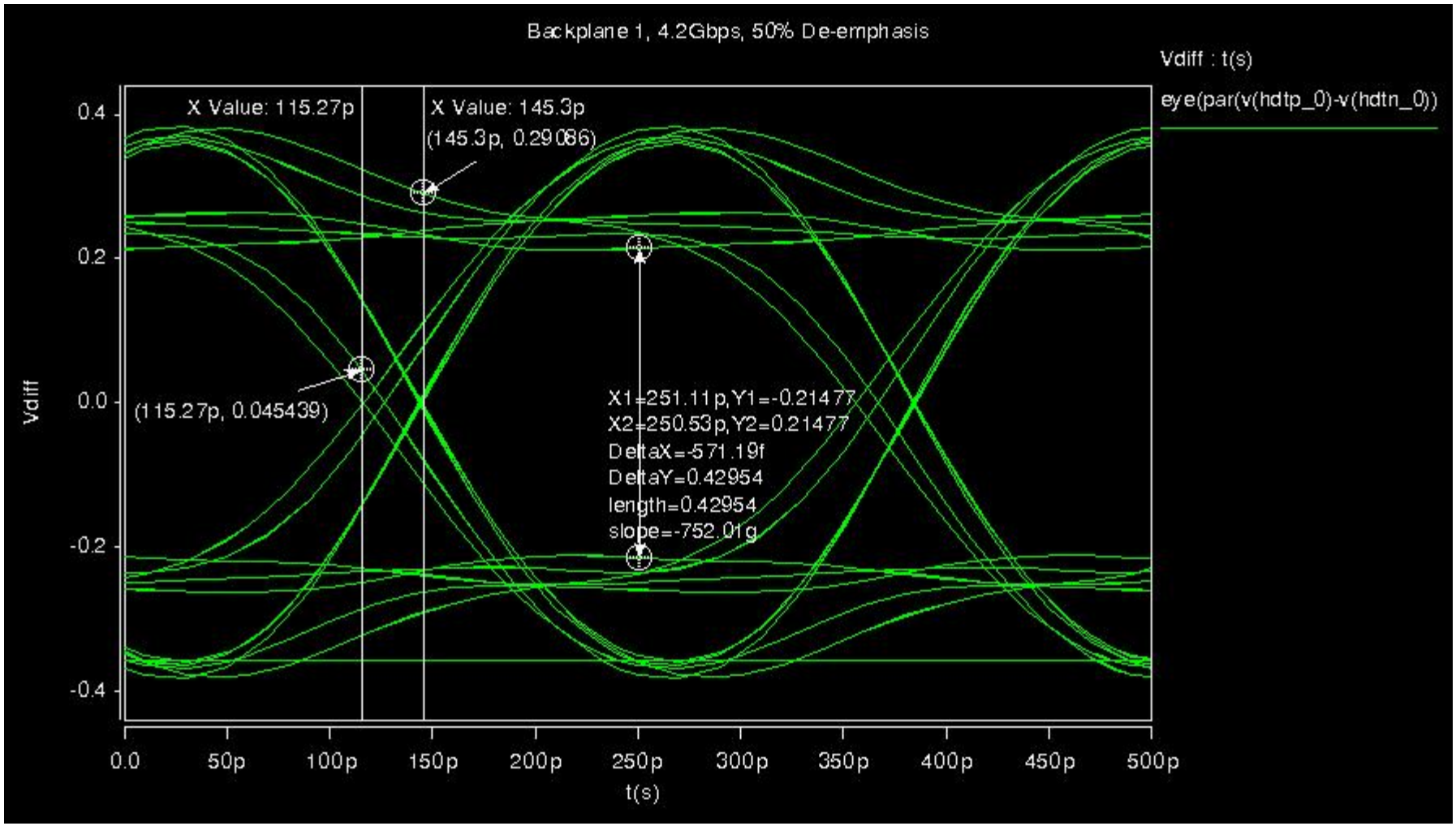
Short Interconnect Characterization

- Resonances on short internal miniSAS cable and short backplanes are considered
- Focus on backplane samples

Sample Simulation



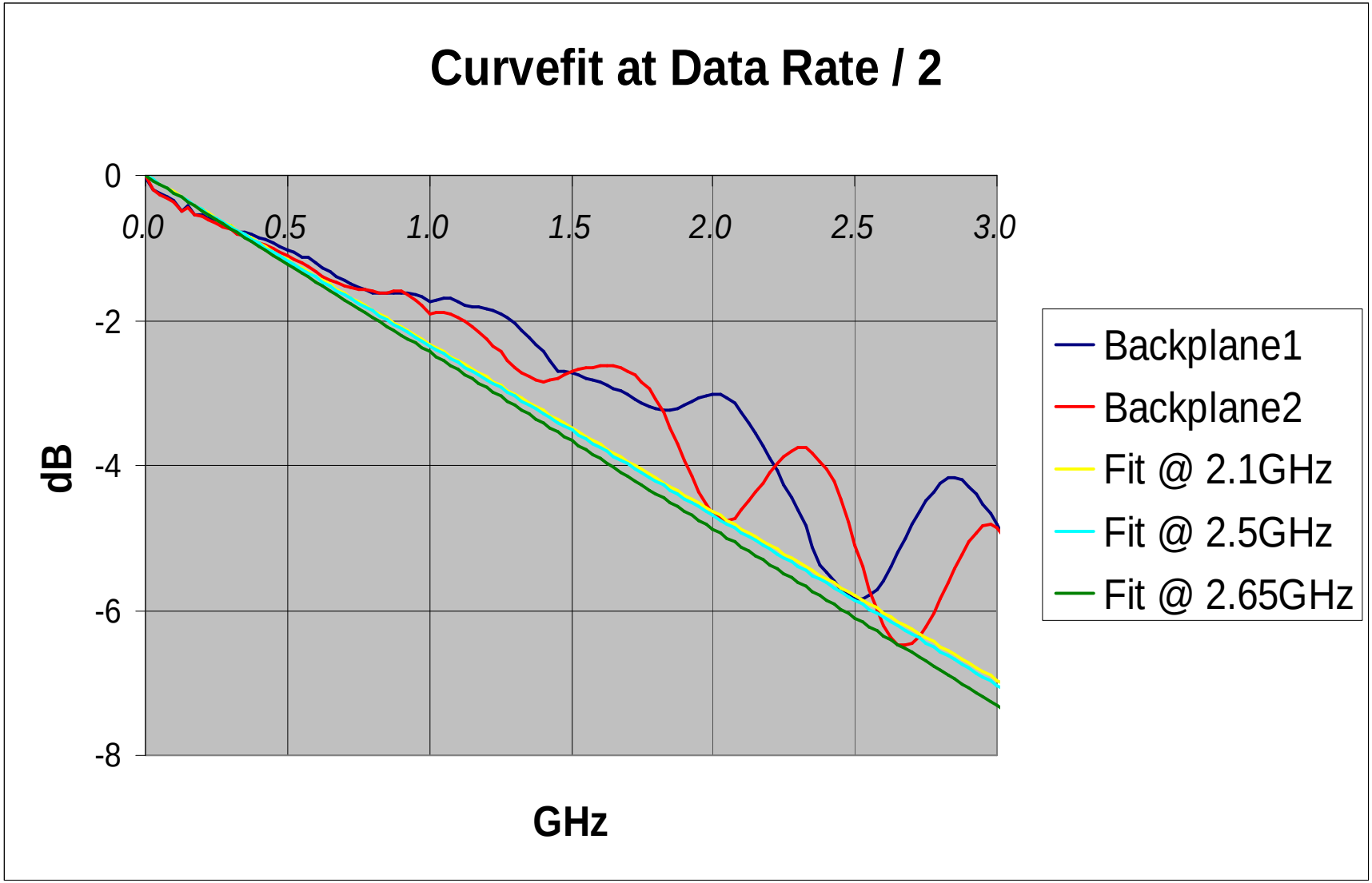
Sample Simulation



Short Interconnect Characterization

- Compare backplane simulation results to low resonance interconnect with same loss at
  - Data Rate / 2
- Simulate at multiple data rates of interest (selected 4.2Gbps, 5Gbps, 5.3Gbps for comparison)

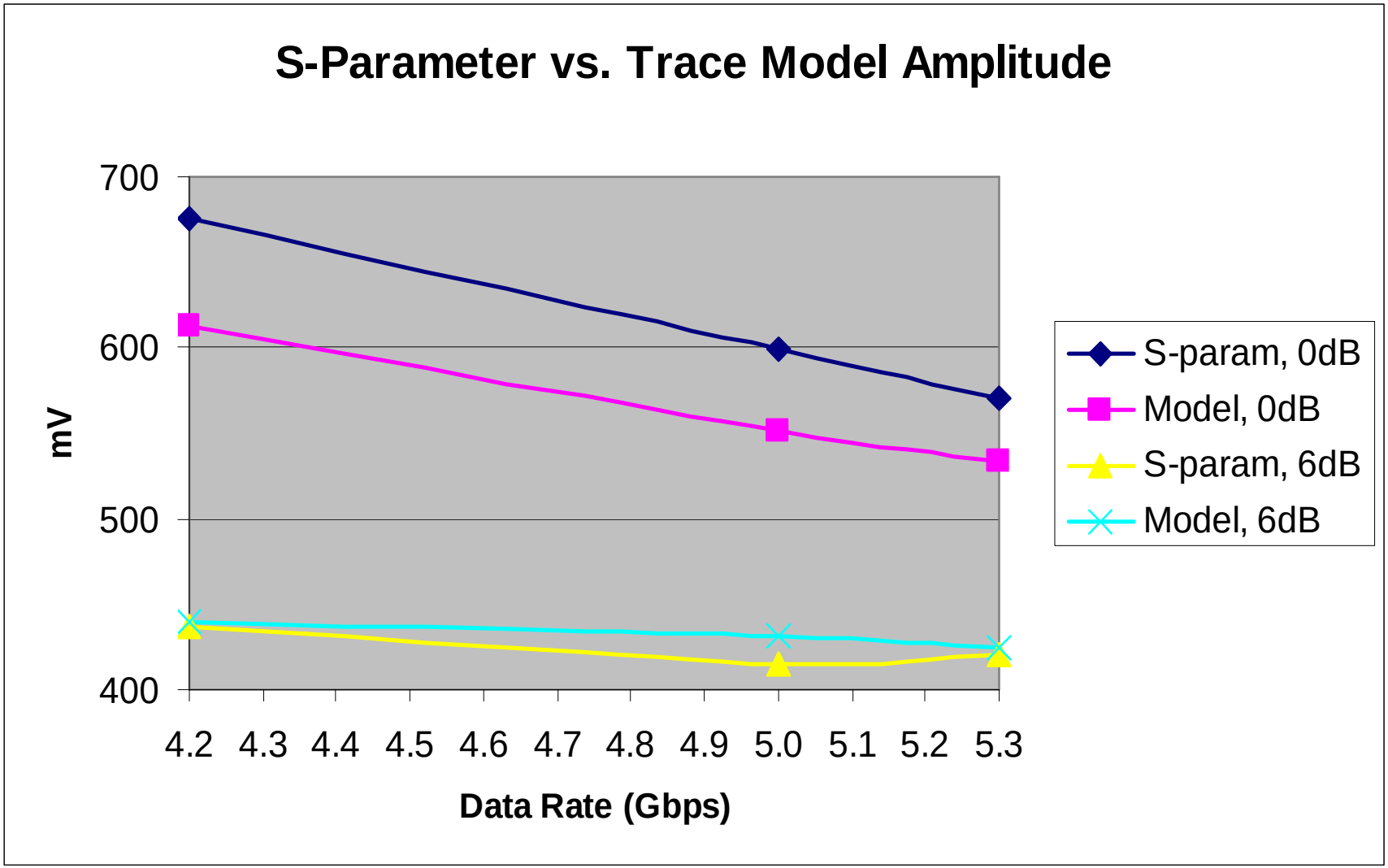
Short Interconnect Characterization



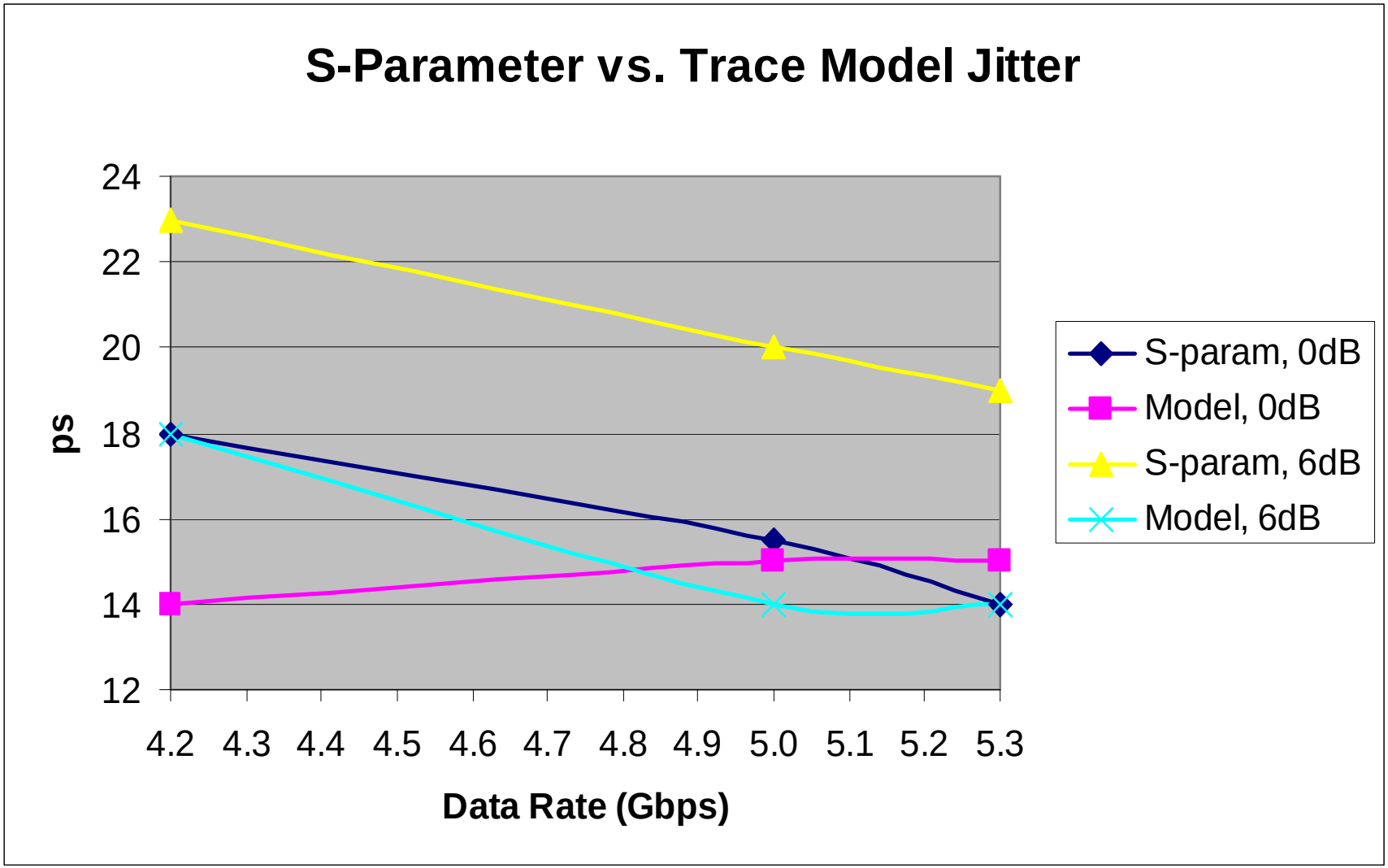
Short Interconnect Characterization

- Compare amplitude and jitter
- K28.5 reference transmitter with Vdiff = 1000mV used
- De-emphasis of 0dB (off) and 6dB (50% reduction on bits 2, 3, 4 and 5)

Short Interconnect Characterization



Short Interconnect Characterization



Conclusions

- A resonance free interconnect with identical loss at “Date Rate / 2” produced less amplitude with no de-emphasis. Probably due to a wide spectral content distribution. Results were inconclusive with 6dB de-emphasis.
- The resonance free interconnect produced less jitter (in particular at 6dB de-emphasis)
- Majority of jitter observed at 6dB de-emphasis is not due to resonances but excessive de-emphasis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