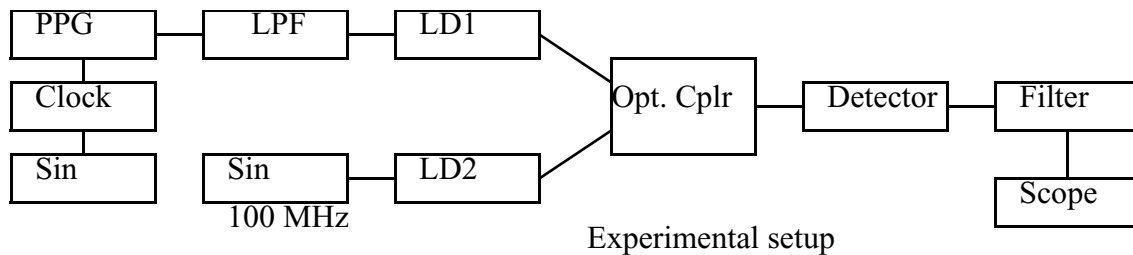


## Simulation of test setup for stressed receiver signal

Petar Pepeljugoski, IBM

On the figures below the simulation results of the test setup for generating the stressed receiver signal are shown. The two sets of figures differ in the bandwidth of the low pass filter after the pattern generator (PPG). The first set is for 6 GHz bandwidth, the second for 9 GHz. The rise/fall time of the simulated signal at the input of the low pass filter was 25ps. The filter bandwidth after the detector was set at 5, 7.5 or 10 GHz. The simulation of the phase modulation of the clock signal was not performed.



Each set of simulation results shows the input signal (output of LPF), the combined signal at the output of the optical coupler and the filtered output at the receiving side (for the bandwidths mentioned above). Each eye diagram has a histogram of the timing jitter. The histogram of the logical one and zero amplitudes at each test point is shown in the insets.

We encountered a problem in determining the ISI penalty with the sinusoidal signal present. This is due to the fact that the sinusoidal signal changes the distribution of the amplitudes around the 1 and 0 levels and the software has difficulties deciding what is the amplitude of the signal in the absence of ISI (topline and baseline). This should be a topic of discussion, since it affects the results and the stressed signal generation. This is particularly important when performing measurements, since in addition to the signal, there is noise present, which further complicates finding the right topline and baseline levels.

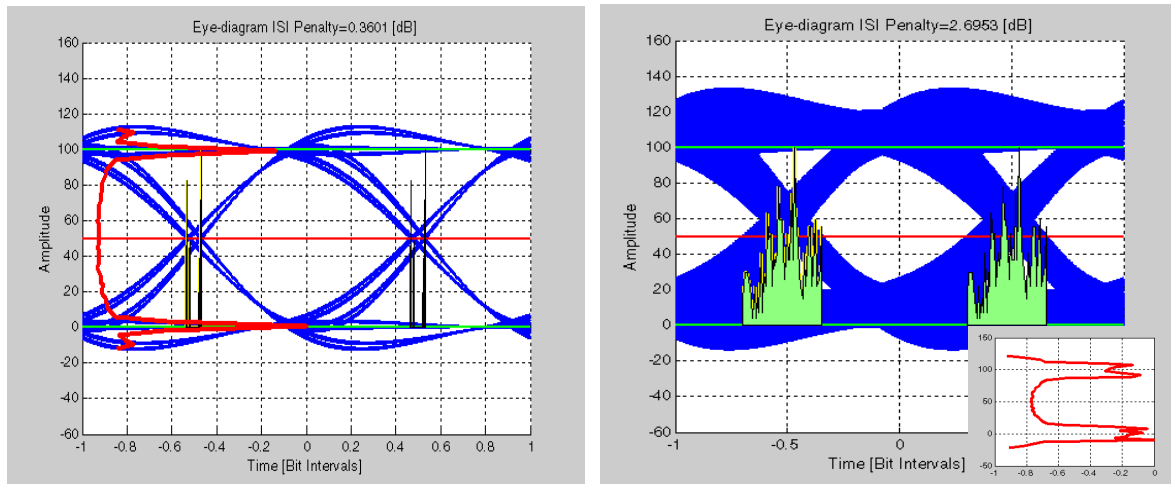
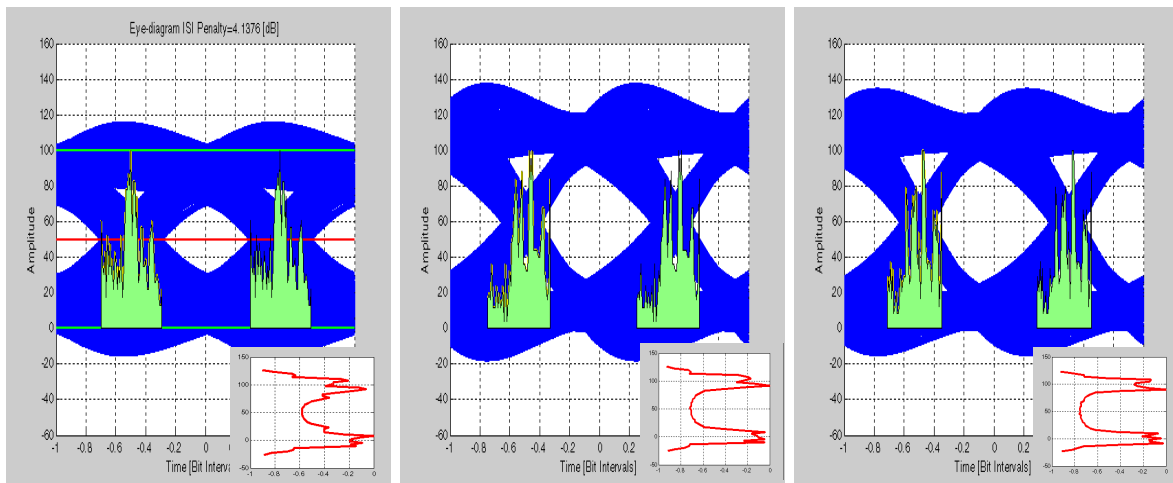
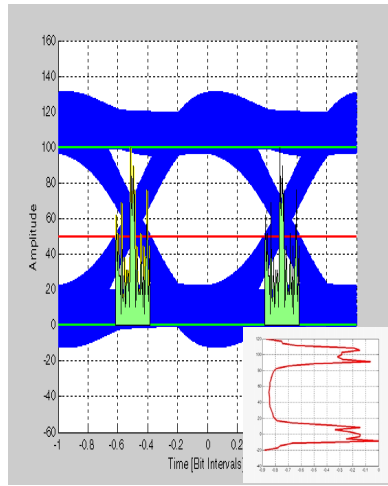
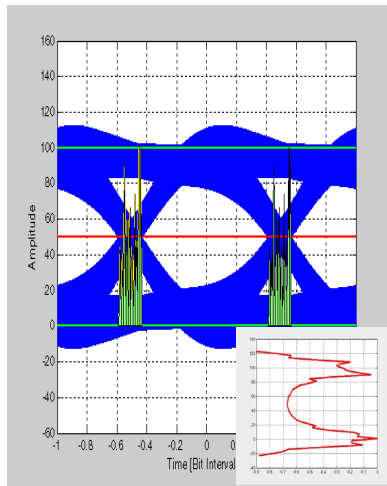
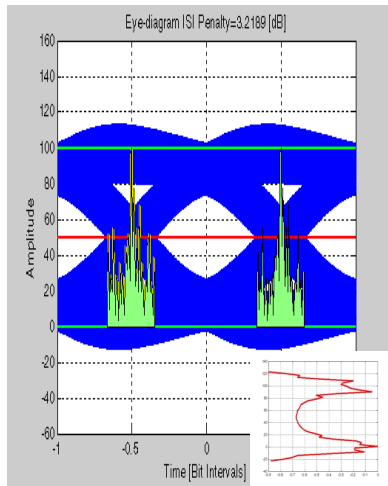
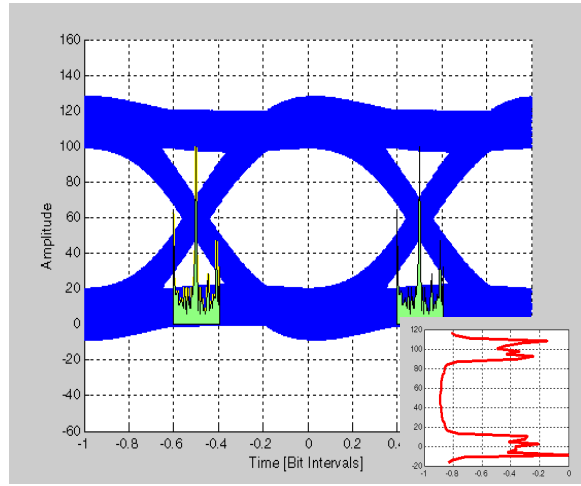
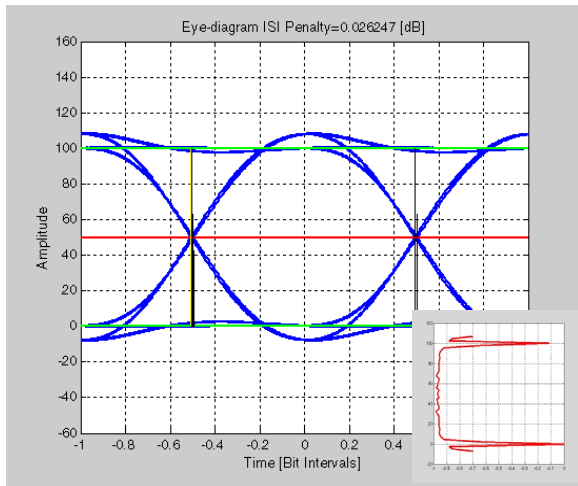


Figure 1. a) Data signal at the output of the low pass filter (left). The filter bandwidth was 6 GHz. Combined signal from the signal at filter output (shown on the left) and the added sinusoidal sigr with relative amplitude of 0.1 and frequency 101 MHz. N=1000 bits. The DJ is 35 ps (pk-pk).



c) Data signal at the output of the receiver filter (left). The receiver bandwidth was 5 GHz. DJ=40 ps d) Receiver bandwidth 7.5 GHz, DJ=38 ps. e) Receiver bandwidth 10 GHz; DJ=36 ps;



Same parameters as for Figure 2, but for low pass bandwidth of 9 GHz.