TP3 Simple stressed Rx Sensitivity
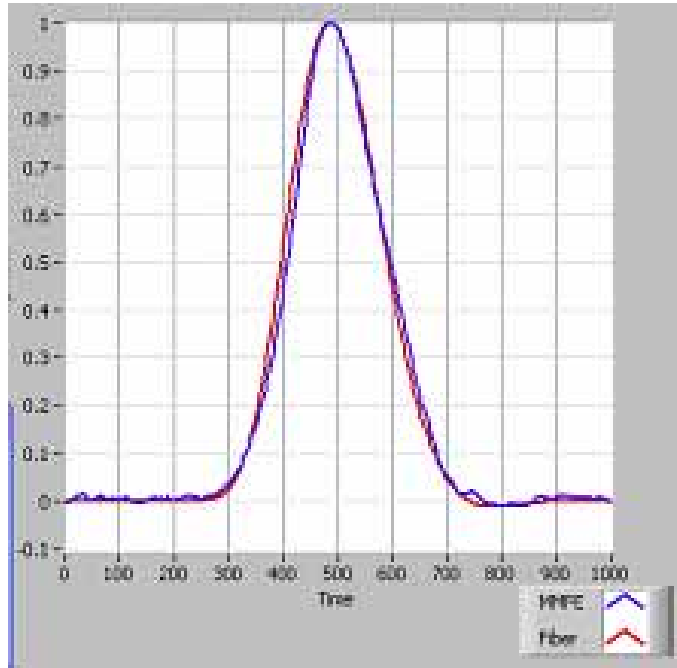
Brian Taylor, Sudeep Bhoja

Stress Rx Sensitivity Setup

```
┌──────────┐      ┌──────────┐      ┌──────────┐      ┌──────────┐
│   10G    │      │          │      │  Linear  │      │          │        Stressed Eye
│ Pattern  │ ───▶ │ EQ Chip  │ ───▶ │   Amp    │ ───▶ │  TOSA    │ ───▶   [eye diagram]
│Generator │      │          │      │          │      │          │
└──────────┘      └──────────┘      └──────────┘      └──────────┘
```
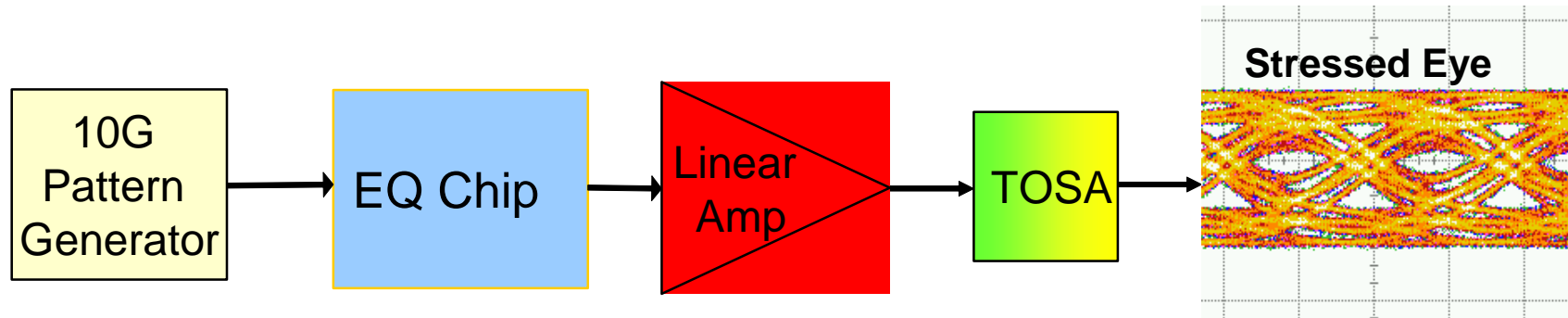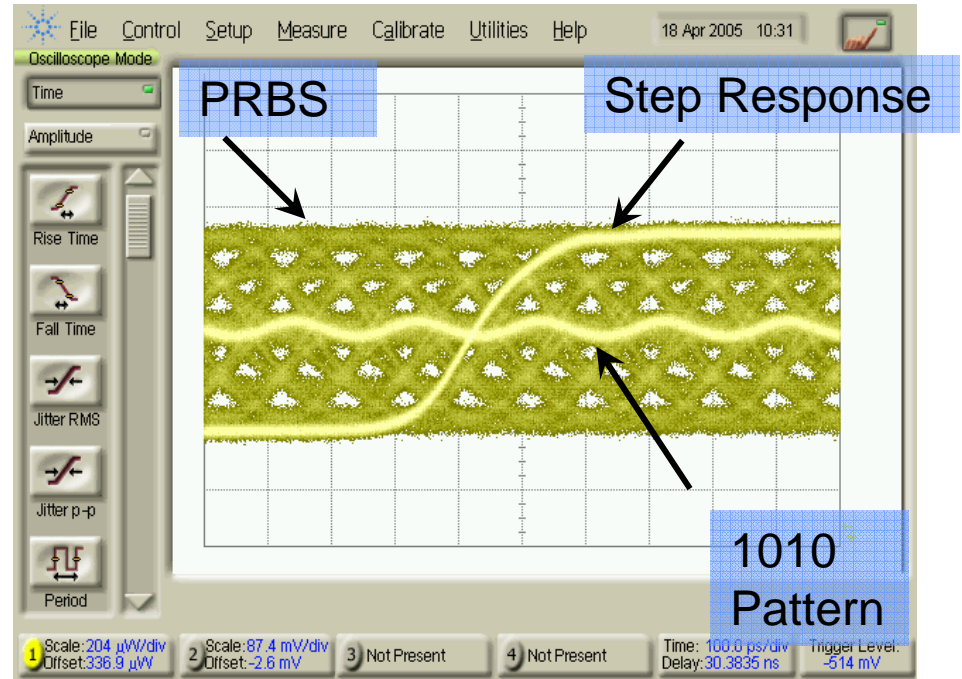
The Stressed Eye Generator can be programmed to emulate LRM TP3 Test by programming taps of the EQ chip

D2.0 TP3 Informative Fit

Red= Target (PIE-D 4.75dBo)

Blue= Fit (PIE-D 4.79dBo)

PRBS

Step Response

1010 Pattern

Measured (20%-80%) rise time of 10bit OMA pattern is ~131ps

Summary

- Test performed using $2^{31} - 1$ PRBS data pattern
- *Measured* receive chain required -8.5dBm Rx OMA to achieve 1E-12 BER
  - 1dB margin over D2.0 informative specs
- Equalization of 4.75dB PIE-D is feasible with robust CDR/Equalizer
  - 1010 pattern sees ~30dB attenuation
  - Requires non-linear equalizers such as DFE
  - Poor clock recovery implementations that extract tones from ½ the symbol rate may fail