# How to Determine Correct Signal Amplitude and VECP?

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Why is This a Problem

- Scopes have various settings for determining signal amplitude (mode, mean, min/max)
- Signals measured are complex signals accompanied by ISI, noise, sinusoidal interference
  - Degradations and data patterns change signal histograms, may confuse scope algorithms
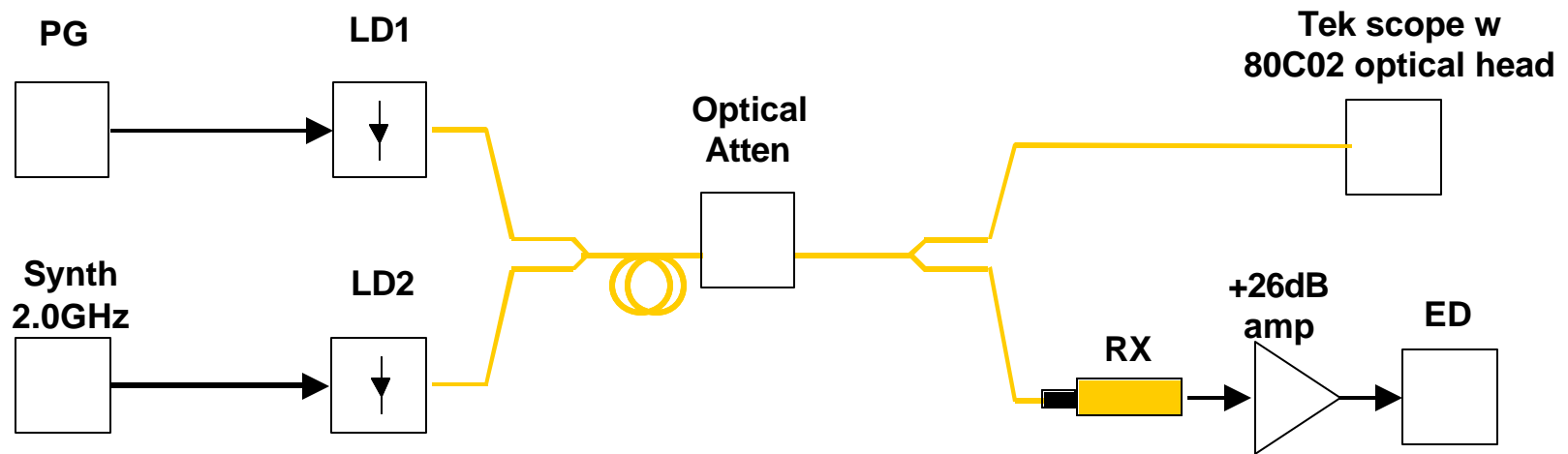- 802.3ae Draft does not adequately specify how measurement should be done
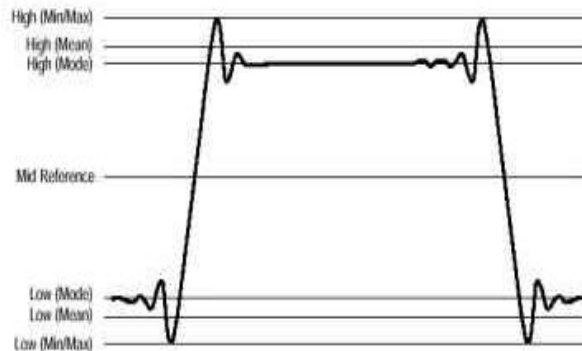
How do we measure amplitude

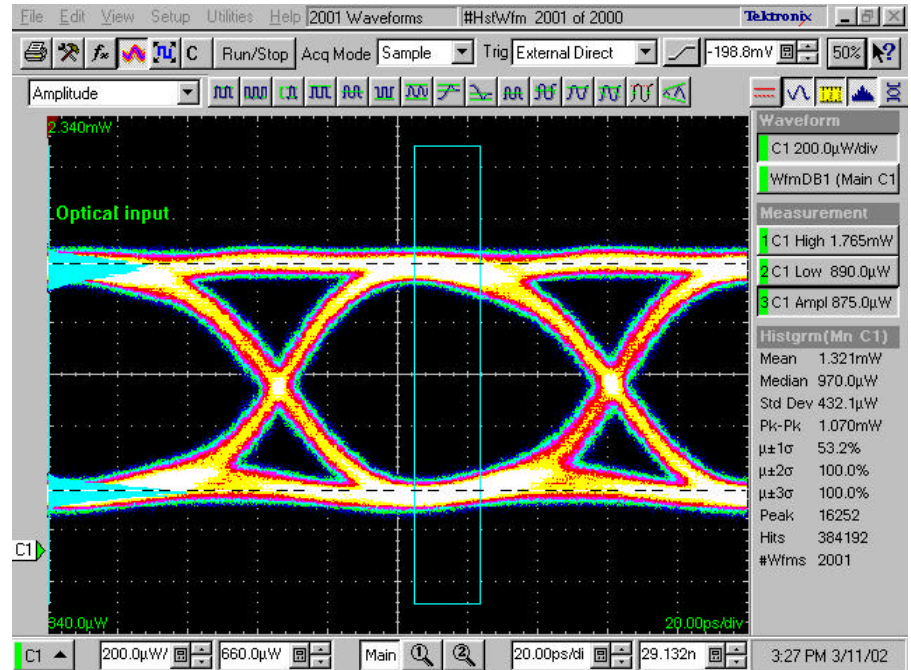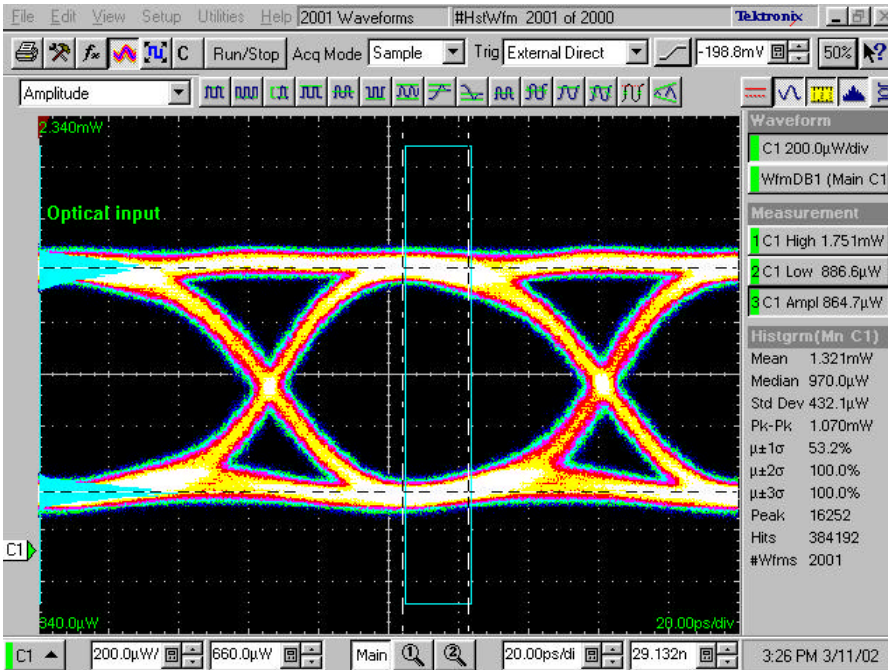- Usually histograms for eyes based on OFSTP4A, mode for signal wavefms.

Eye-diagram ISI Penalty=2.5238 [dB]
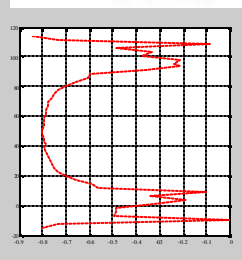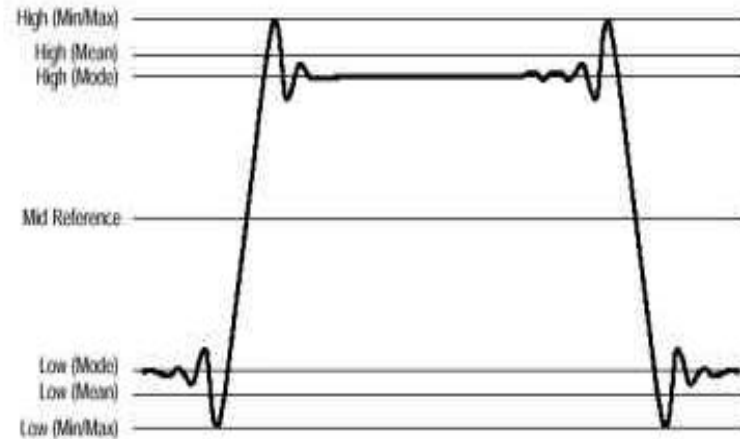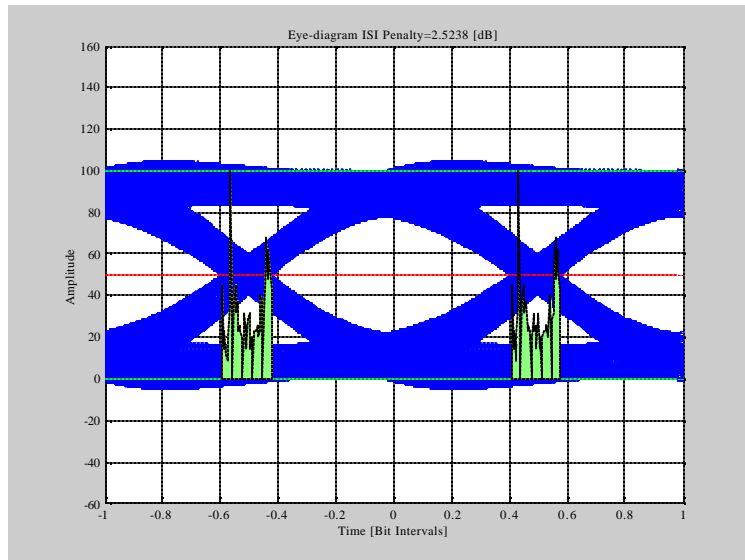
Test Setup

Measured Eye Diagrams, Ideal, No AM, No VECP
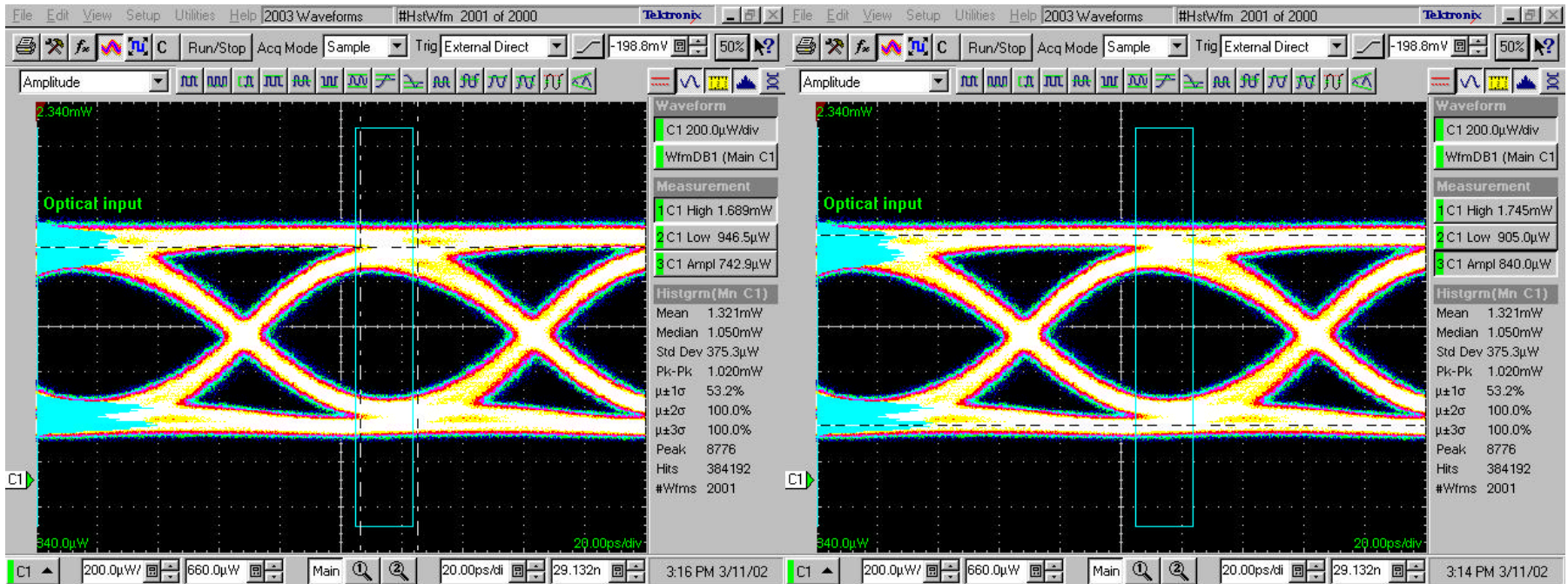
Ideal, no AM, EYE (OFSTP4A)   Ideal, no AM, Pulse (mode of hist.)

Measured Eyes With 2.2 dB VECP, No AM

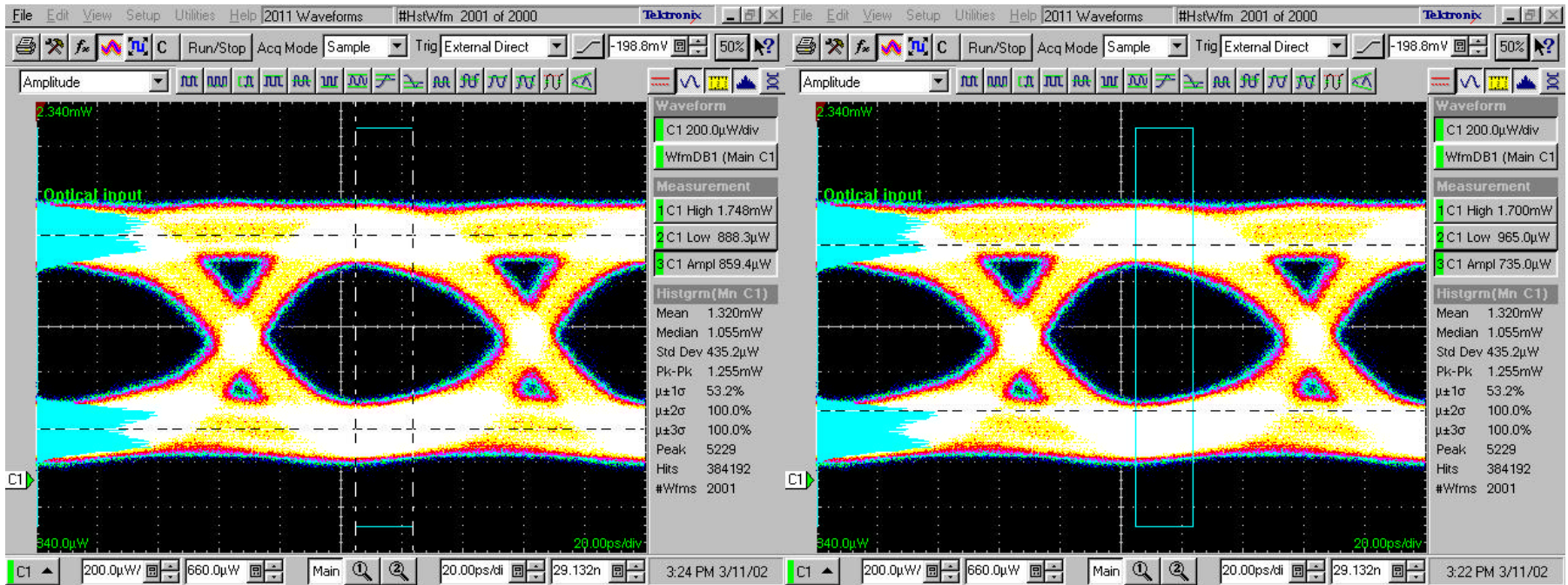2.2 dB VECP, no AM,
EYE method

2.2 dB VECP, no
AM, Pulse method

Measured Eyes, Ideal With AM
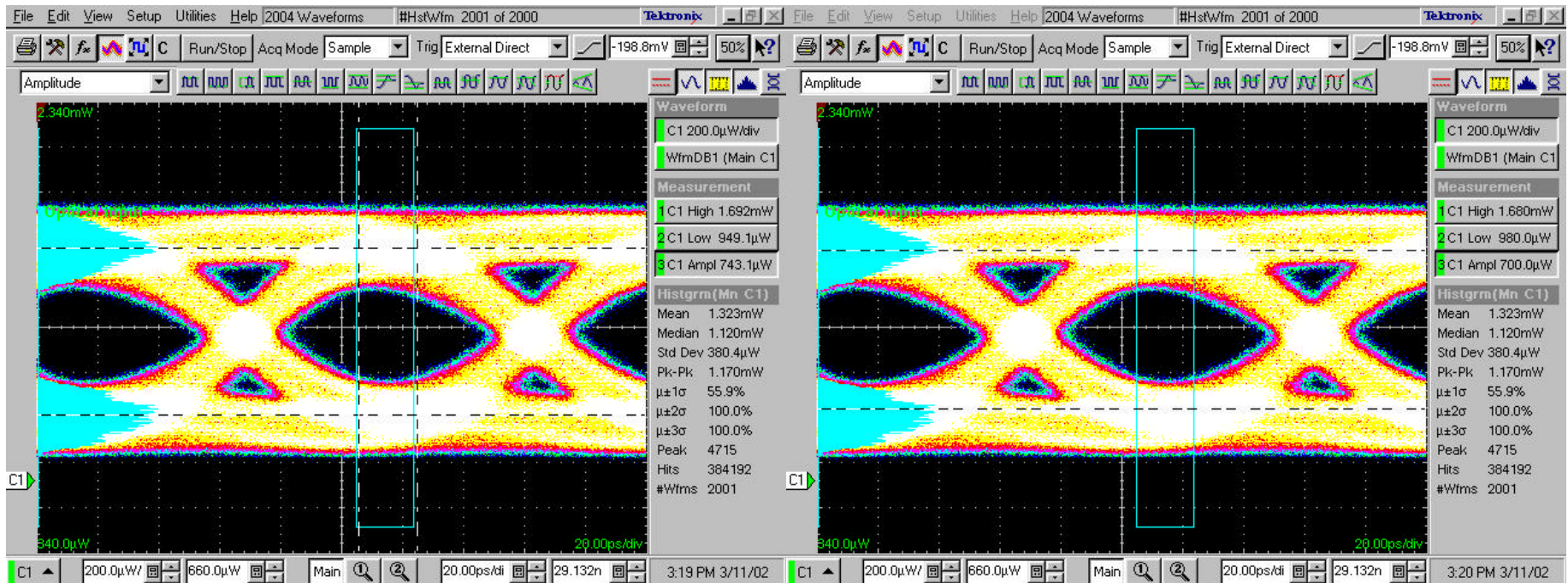
Ideal, with AM, Eye method   Ideal, with AM, Pulse method

Measured Eyes, VECP With AM

VECP, AM, EYE method   VECP, AM, Pulse method

Summary of Results

Am stress?	Method	ISI?	Amplitude
No	EYE	No	865
No	Pulse	No	875
No	Eye	Yes	743
No	Pulse	Yes	840
Yes	EYE	No	859
Yes	Pulse	No	739
Yes	Eye	Yes	743
Yes	Pulse	Yes	700

Variability – up to 0.9 dB

How Do We Resolve This?

- The standard does not adequately specify how to measure the signal amplitude

  - Affects also the stressed signal VECP determination

- We need to specify the settings, in order to avoid variability in measurements at different sites