XAUI Jitter and ISI Simulations

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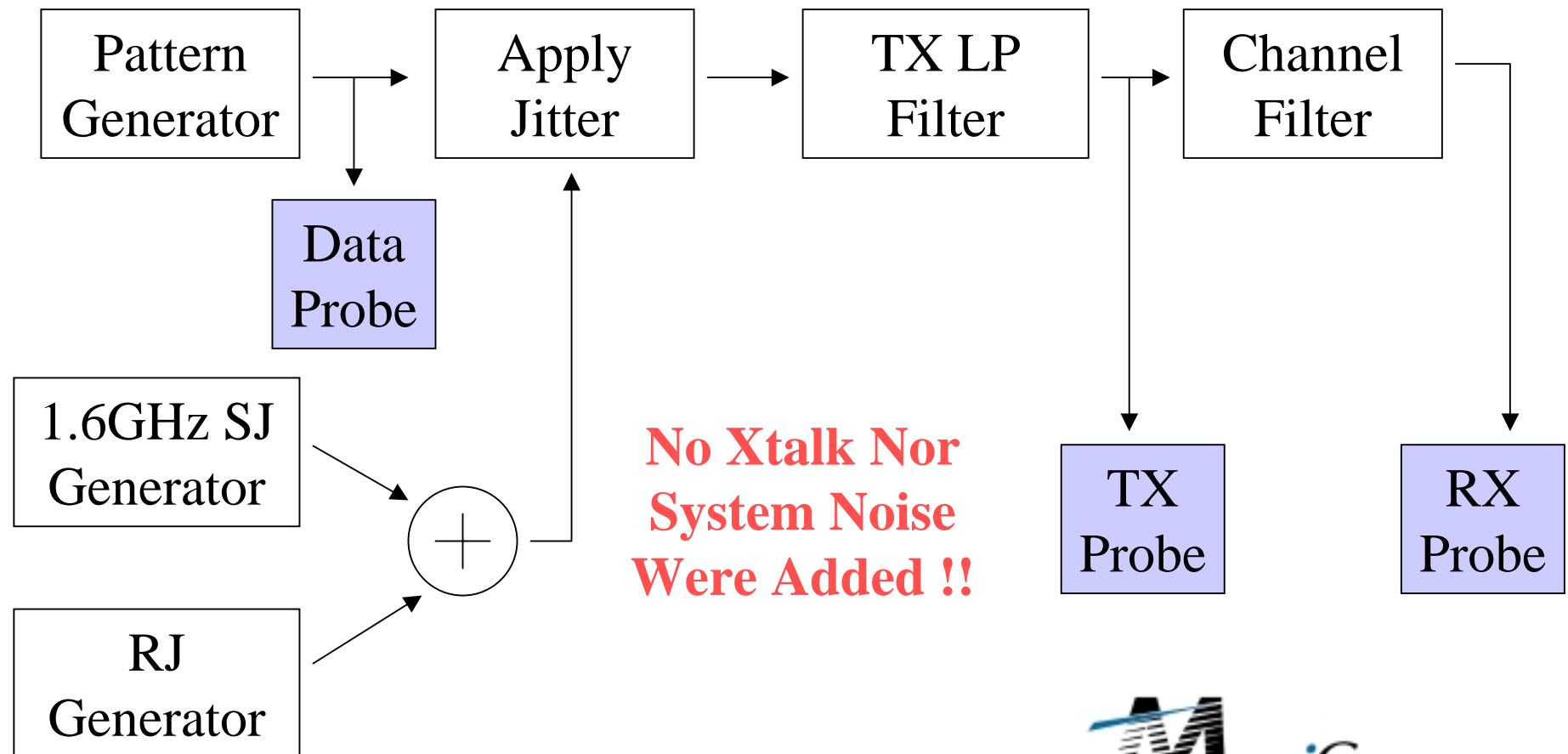
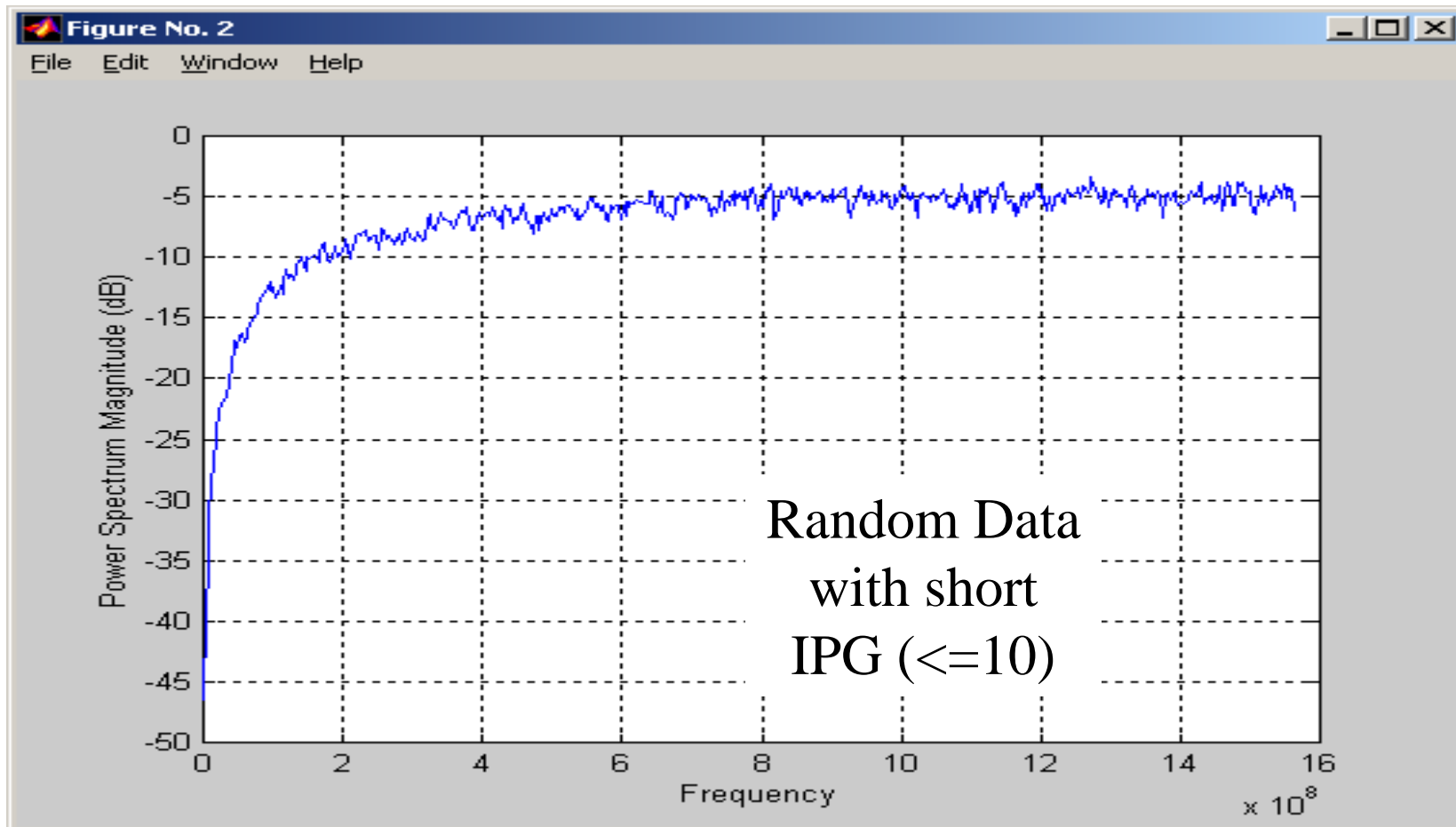**January, 2001 Interim Meeting**

Agenda

- MATLAB simulations of XAUI Compliant Channel

- Check and compare to transmit and Receive Eye Masks

- Compare various Jitter Conditions

- Introducing a Killer Packet which maximize Jitter And Minimize Eye Pattern

- Propose possible Solutions

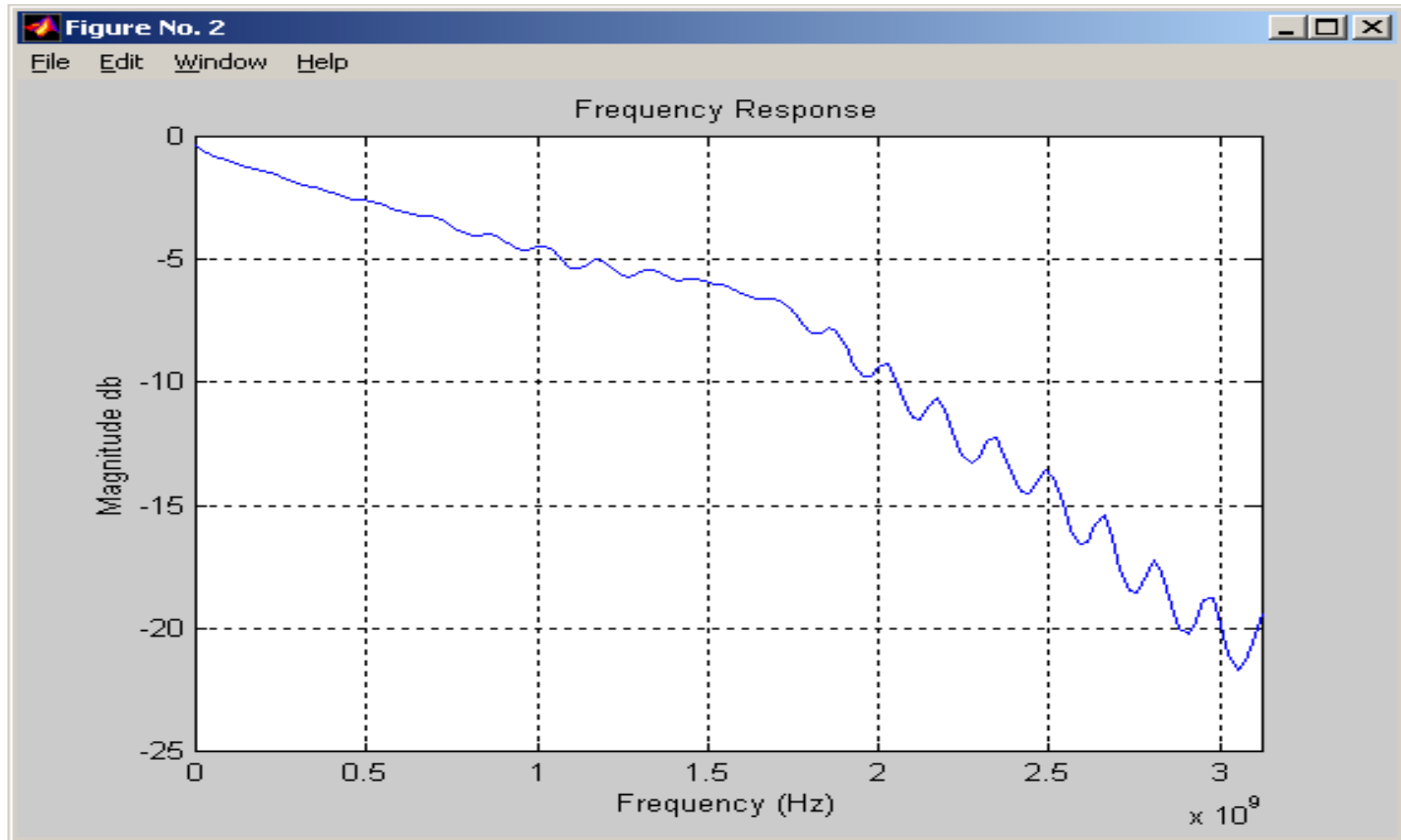# Simulating With The Worst Case S21 Proposed

Pattern Generator → Apply Jitter → TX LP Filter → Channel Filter

Data Probe

1.6GHz SJ Generator

RJ Generator

No Xtalk Nor System Noise Were Added !!

TX Probe

RX Probe

MystiCom

Data Pattern Power Spectral Density

Random Data with short IPG (<=10)

This is not the worst case kind of pattern !
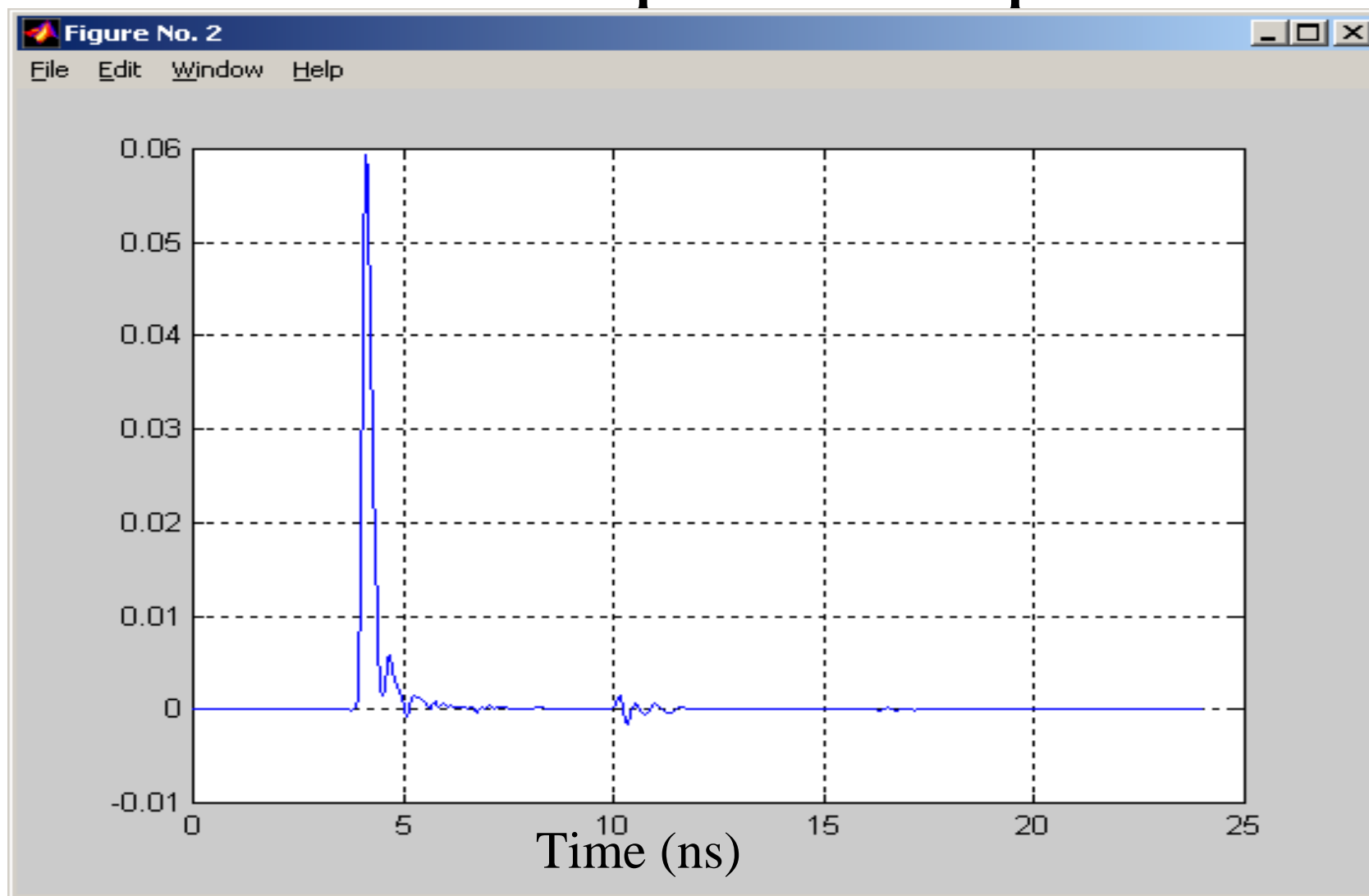
Channel Frequency Response

Based on the file IEEE_CH_21_Final.txt
sent by Anthony 9th January 2001
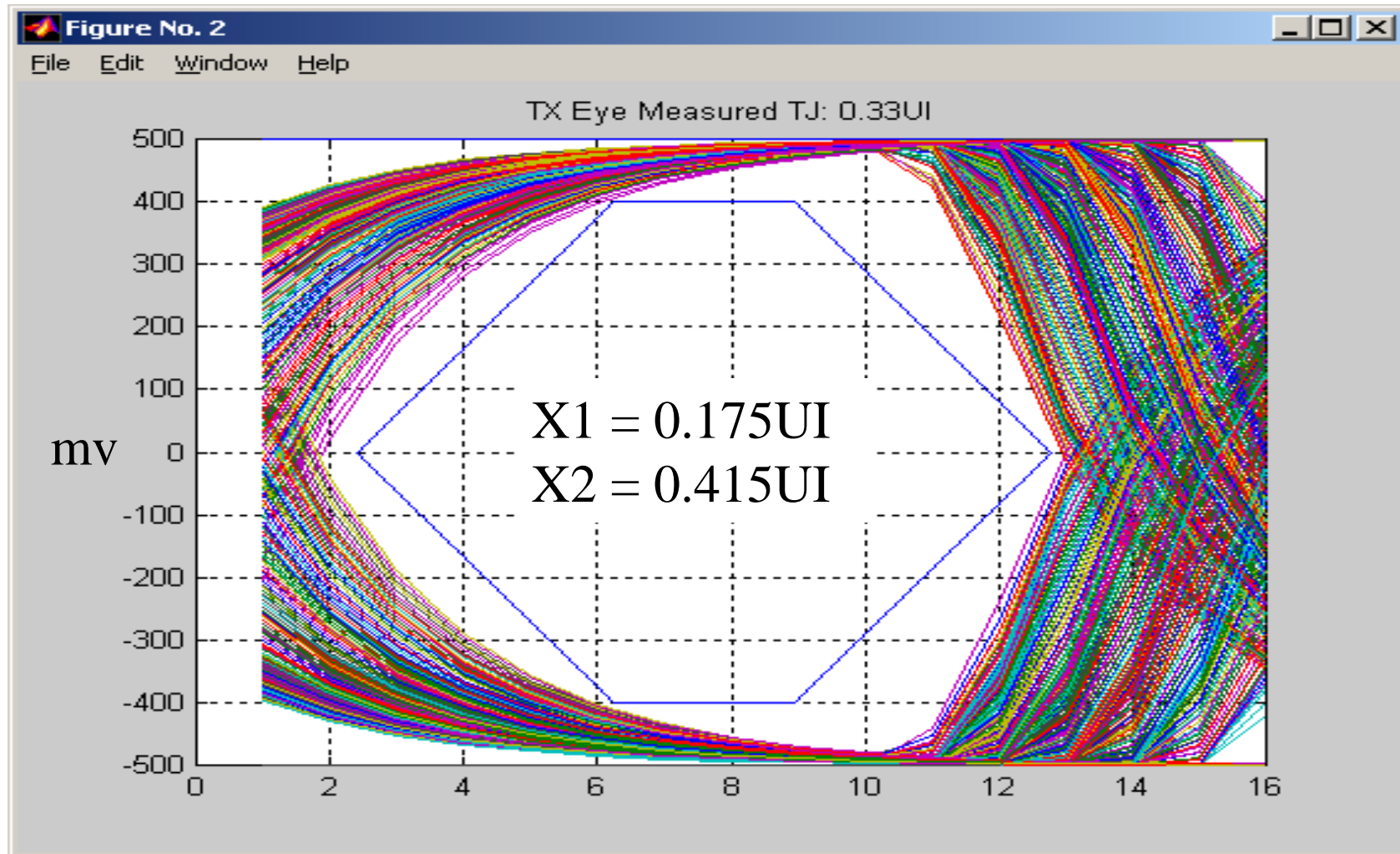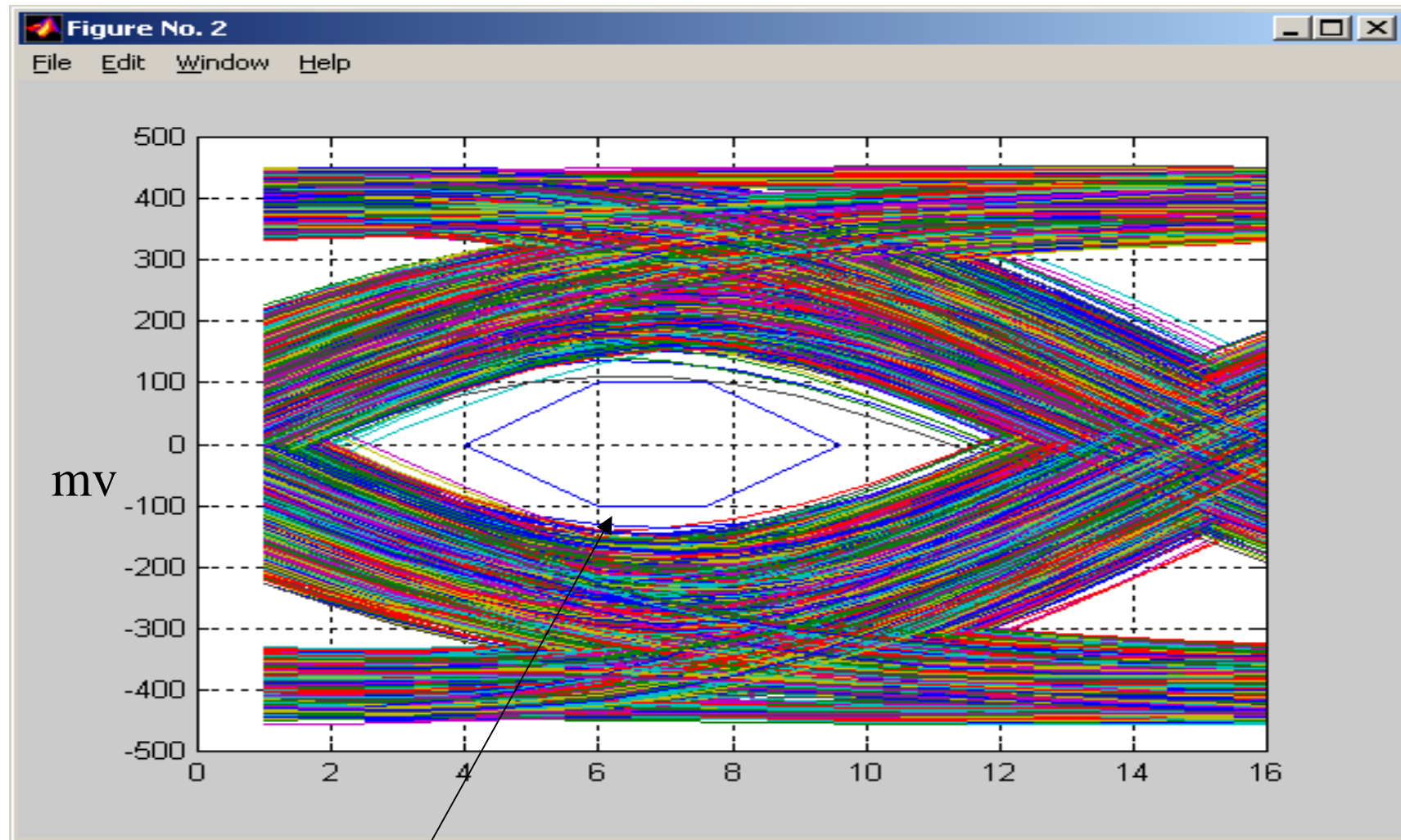
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Channel Impulse Response

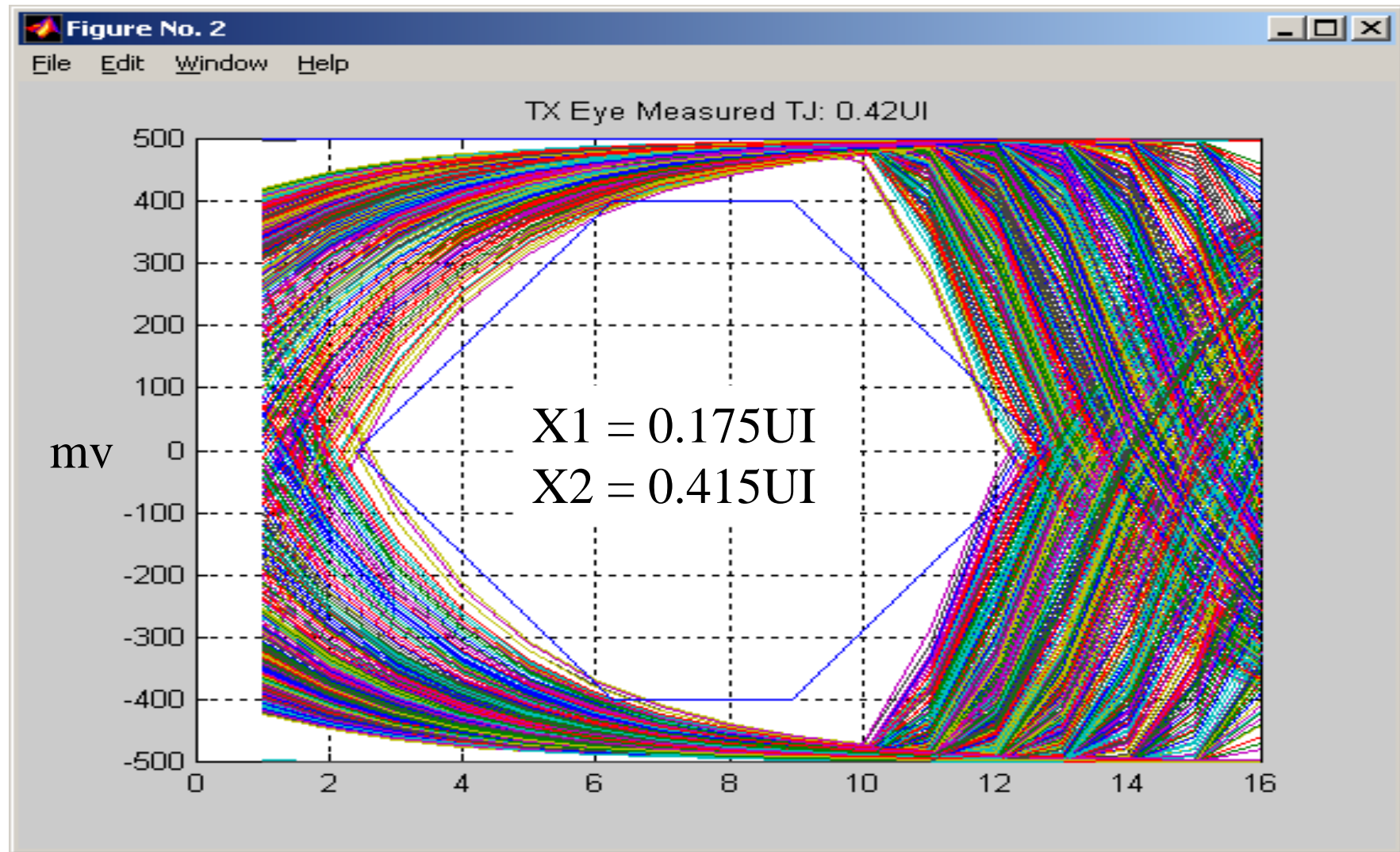# TX Eye – Apply Only RJ: 0.35 UI

RX Eye

X1 = 0.325UI   X2 = 0.45UI

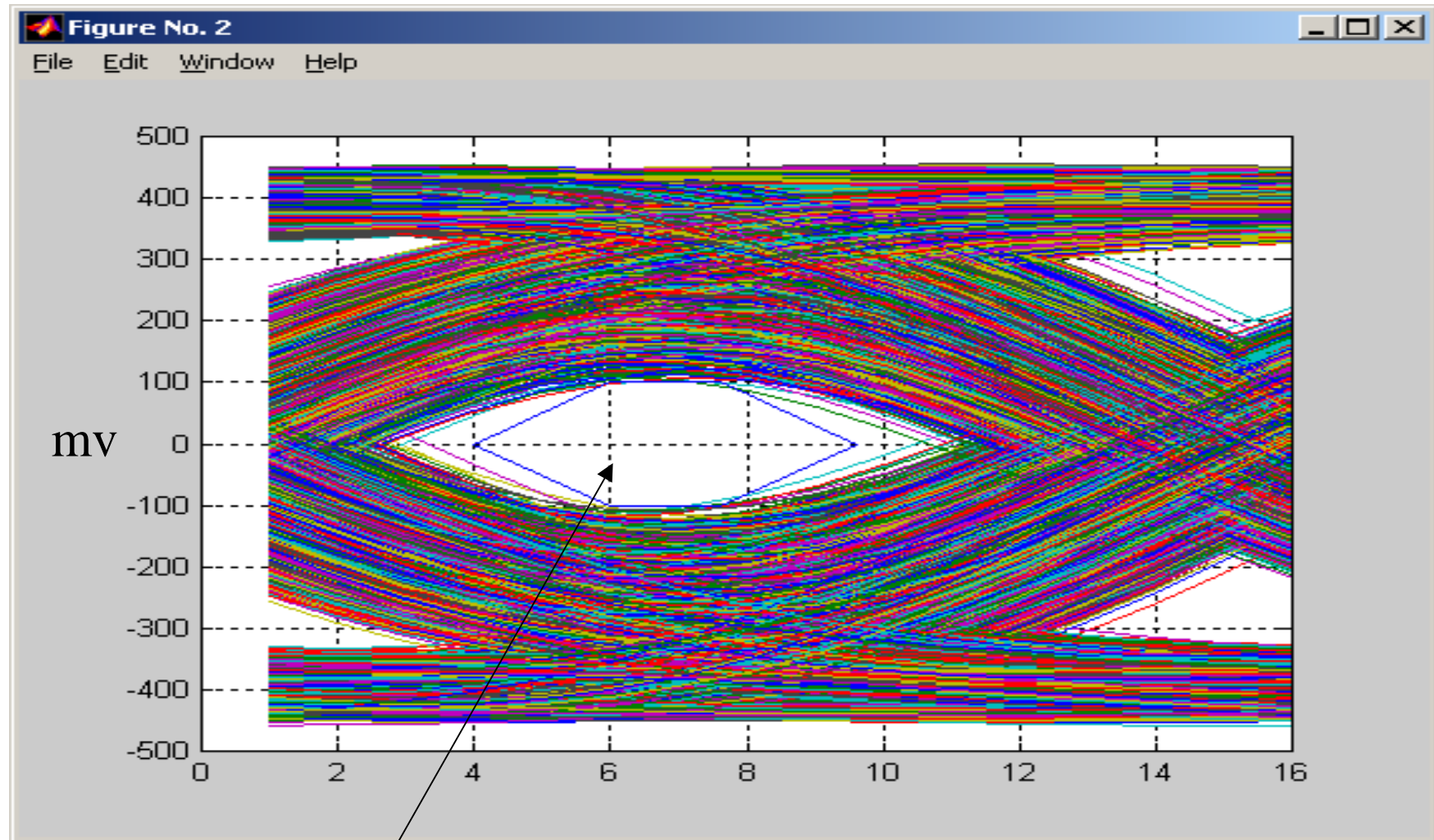# TX Eye: 0.1UI SJ + 0.35UI RJ

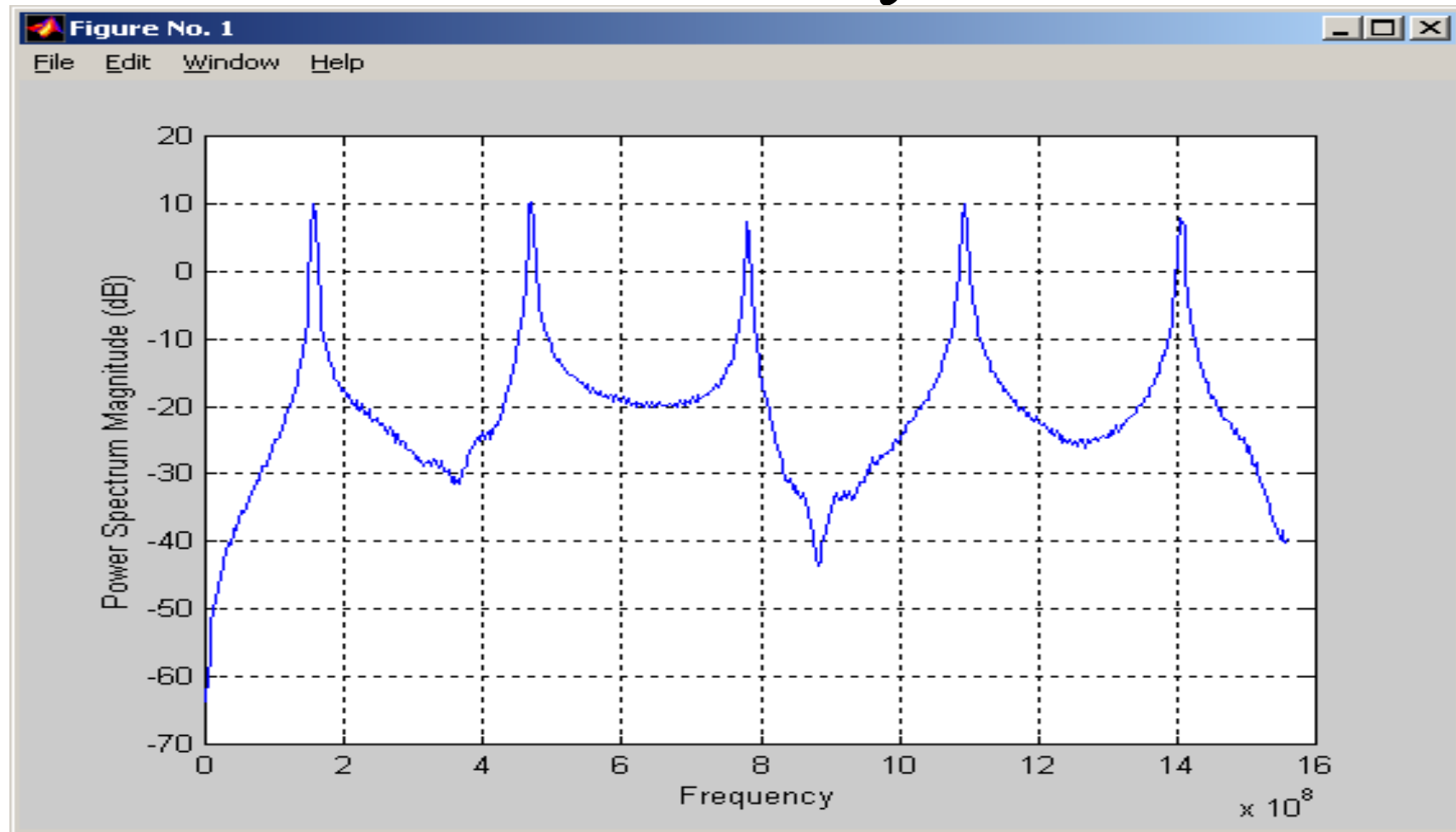# RX Eye
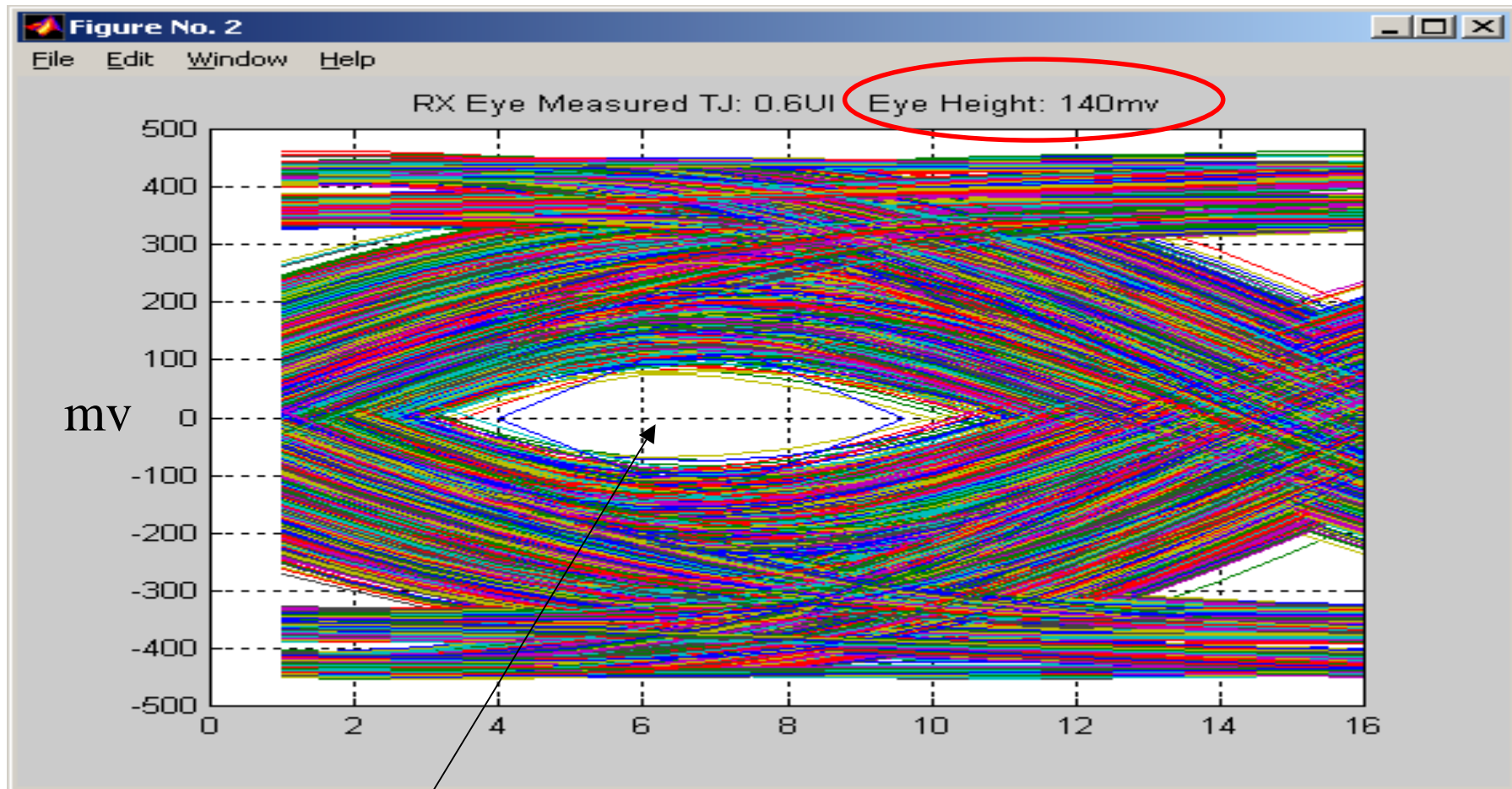

X1 = 0.325UI   X2 = 0.45UI

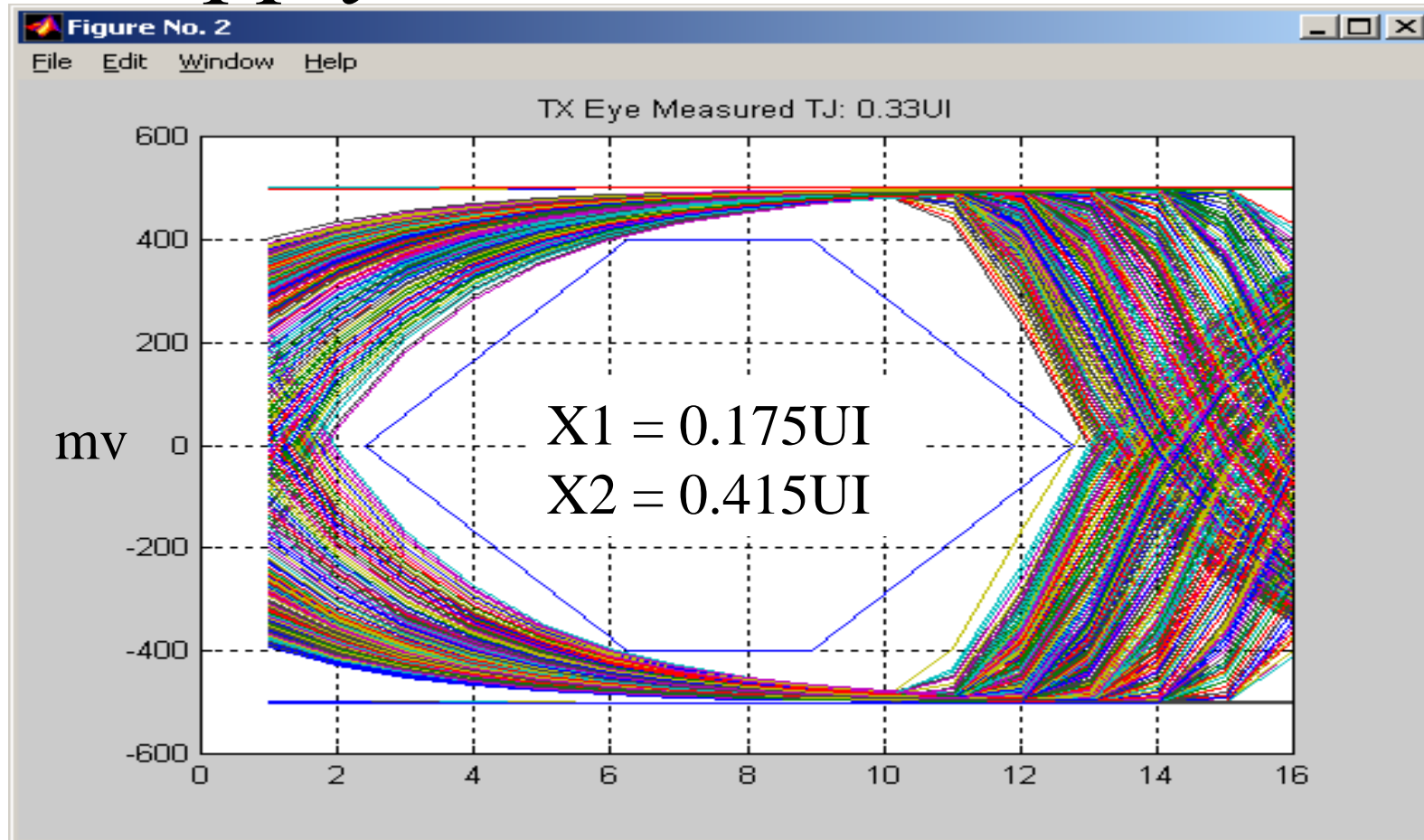# ISI Killer Pattern Power Spectral Density

RX Eye – Using ISI Killer Pattern Apply 0.35UI RJ + 0.1UI SJ

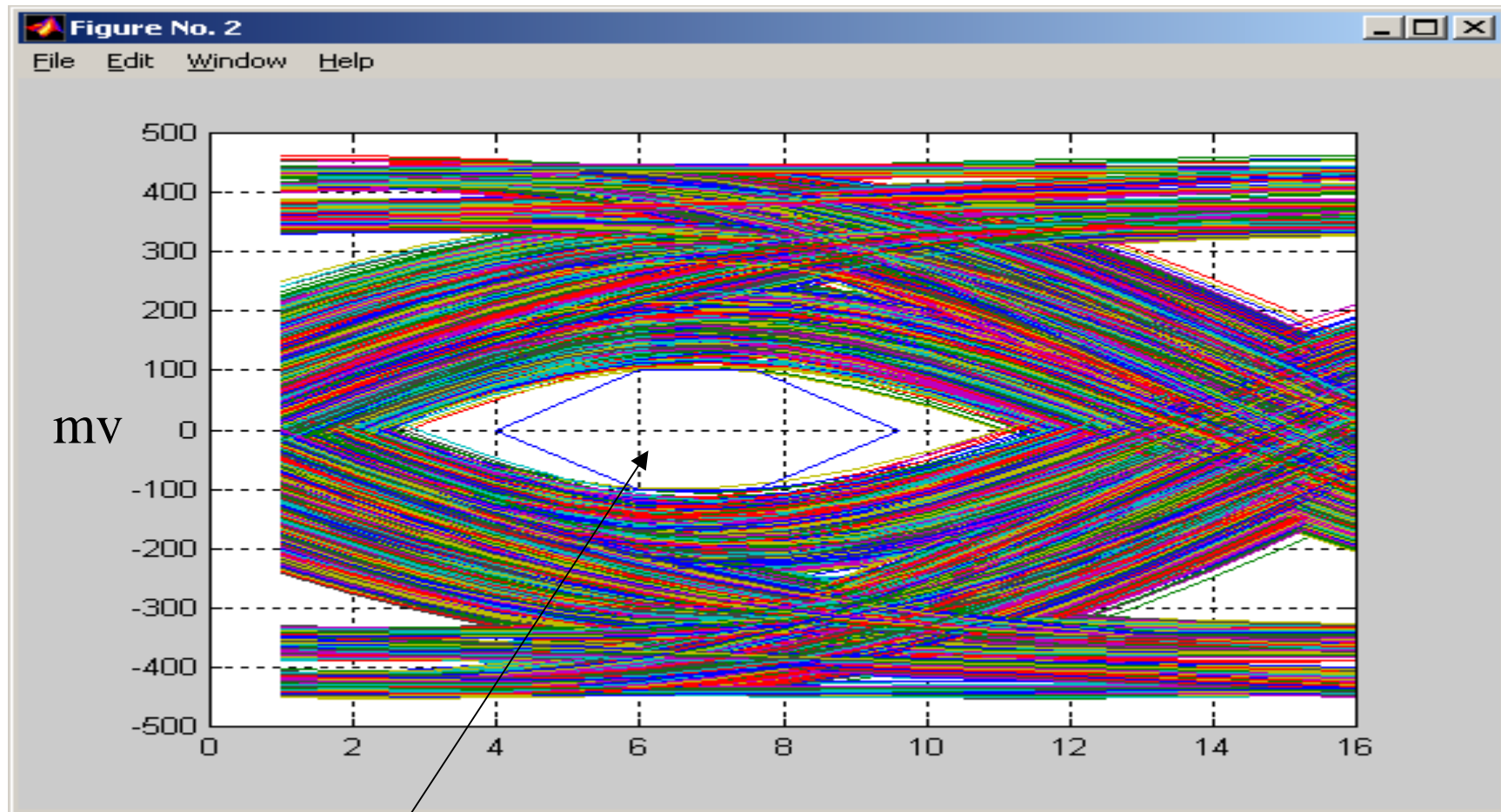X1 = 0.325UI   X2 = 0.45UI

TX Eye – Using ISI Killer Pattern Apply 0.25UI RJ + 0.1UI SJ
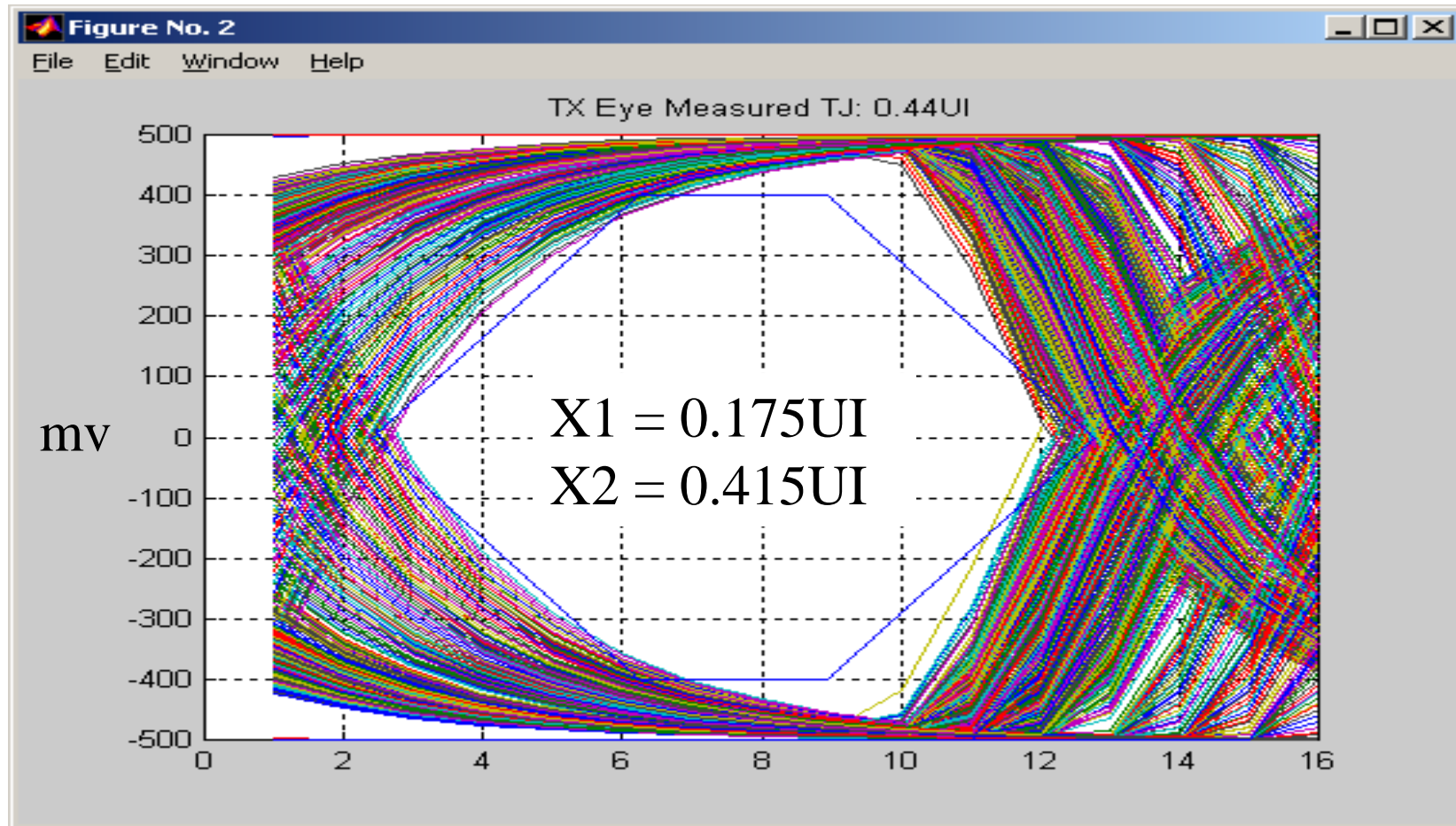
RX Eye: No Margin For Xtalk and Noise

X1 = 0.325UI   X2 = 0.45UI

TX Eye – Using ISI Killer Pattern Apply 0.25UI RJ + 0.2UI SJ

TX Eye Measured TJ: 0.44UI

X1 = 0.175UI
X2 = 0.415UI

RX Eye Is Too Small

X1 = 0.325UI   X2 = 0.45UI

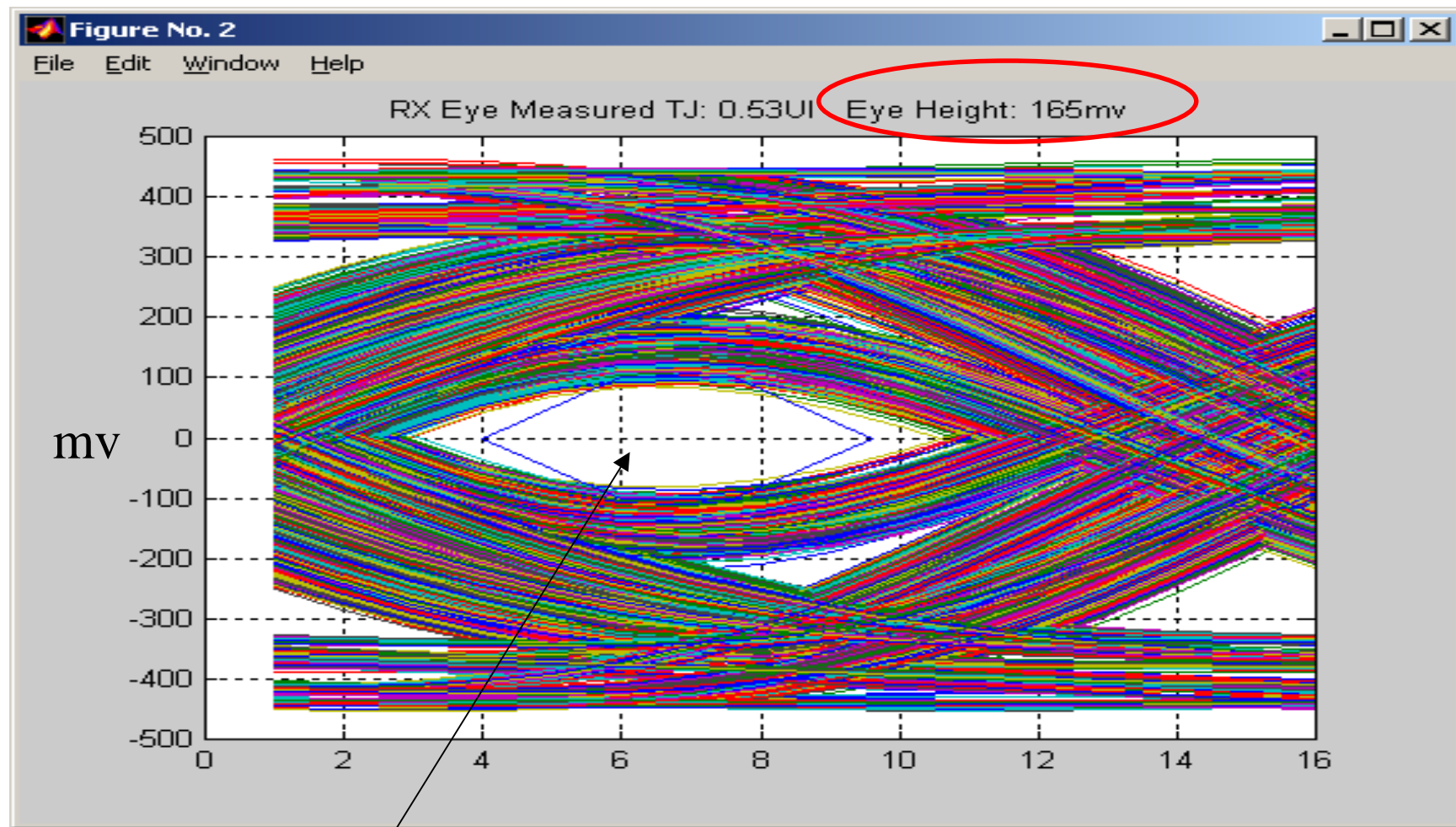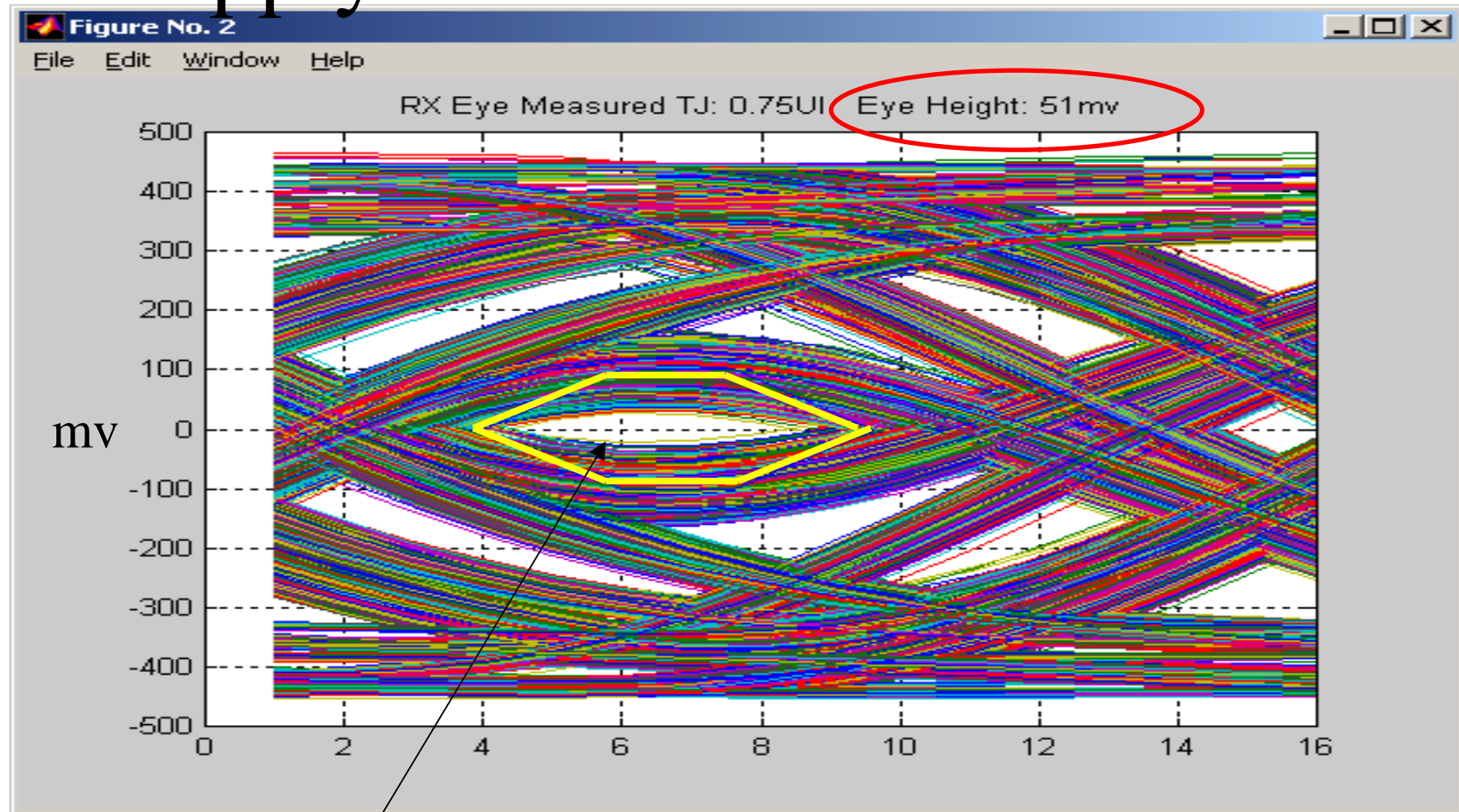# RX Eye – Using ISI Killer Pattern Apply 0.18UI RJ + 0.17UI SJ

X1 = 0.325UI   X2 = 0.45UI

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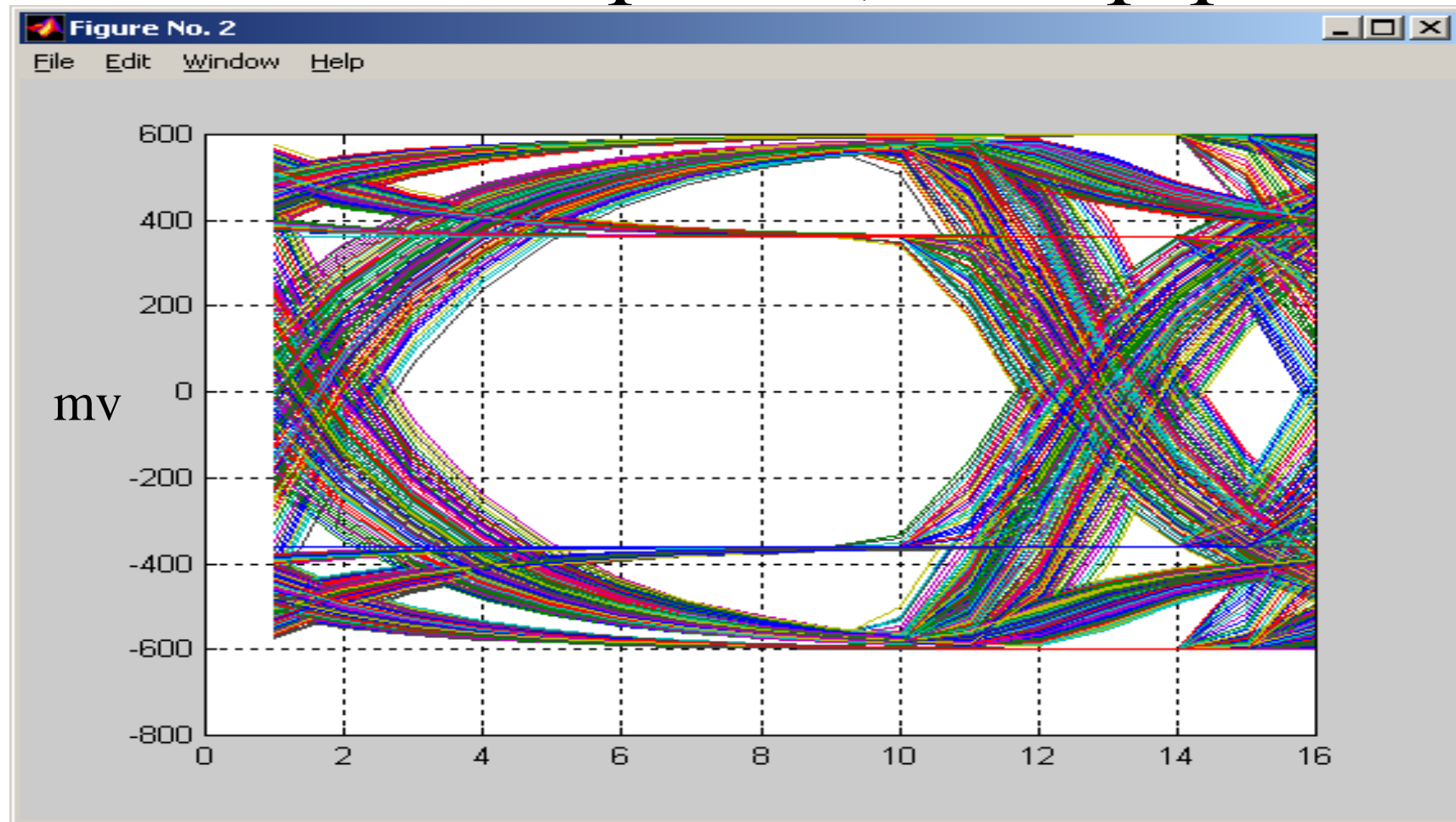# RX Eye – Using ISI Killer Pattern Apply 0.18UI RJ + 0.27UI SJ

X1 = 0.325UI   X2 = 0.45UI

TX Eye: 0.18 RJ + 0.27 SJ
With PreEmphasis, 1.2v p-p

Rx Eye With PreEmphasis

X1 = 0.325UI   X2 = 0.45UI

Possible Solutions

- Any of the following steps may be applied:
- Determine Upper Frequency Limit for Sj
    - No one tested FC with >5Mhz
- Select a better Compliance Channel
    - Define exact BKPN Physical Dimensions
- Decrease Eye Pattern Amplitude in Rx
- Easier Jitter Requirements