

# **TWDP improvements: preview**

Piers Dawe

Agilent

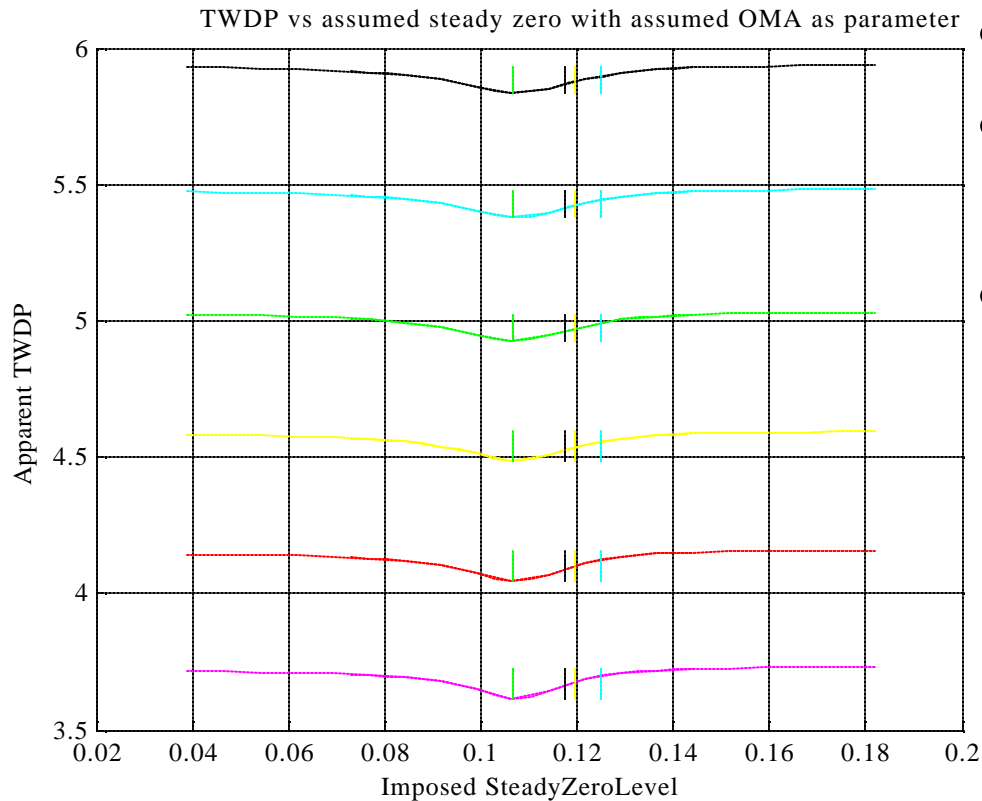
# Small range of TWDP requires auto-scaling

- Fast clean NRZ transmitter 3.6 dB  
Rectangular “1 ps risetime” NRZ (usual Rx filter)
- Spec limit 4.7 dB
- Range from “perfect” to fail only 1.1 dB
- Scope and optical switches optical power cal and reproducibility  $> \sim 0.2$  dB
  - Unacceptable cause of irreproducibility
- To greatly reduce this, TWDP code must use just a measured waveform, scaling (and offset) unknown, and “calibrate itself” automatically
  - We must automate the extraction of scaling
- Improvements made since August
  - We now can automate the extraction of scaling

# Importance of getting SteadyZeroPower right

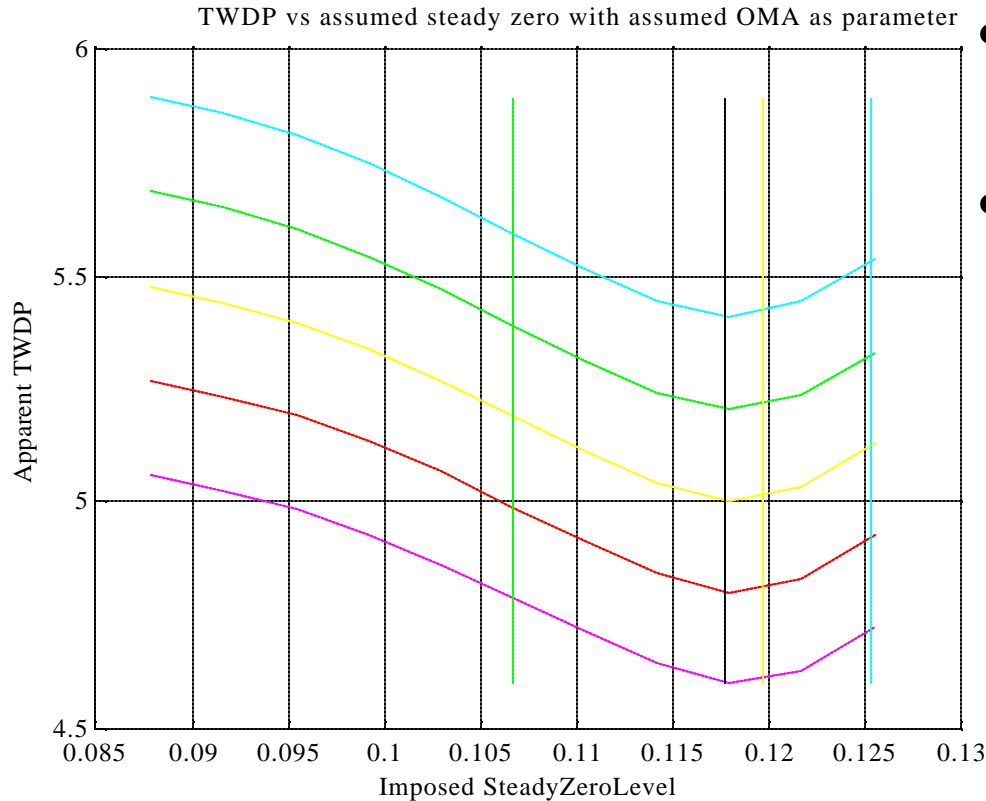
- Wrong apparent zero level (either way) gives worse TWDP by  $>\sim 0.1$  dBo for long equalizer,  $\sim 0.5$  dB for short equalizer
  - Examples on following slides
  - Can search for optimum but also can calculate it
  - It doesn't matter if e.g. estimate of OMA uses a different “zero level”
- Recommend automating this in TWDP code

# Reported TWDP as function of imposed SteadyZeroPower



- Long equalizer
- Curves for different imposed “MeasuredOMA”
- Best “SteadyZeroPower” does not depend on size
  - Vertical bars are candidate methods of finding “SteadyZeroPower”: this can now be done in TWDP core code

# Reported TWDP as function of imposed SteadyZeroPower



- 14+5 equalizer
  - Much bigger effect
- Best “SteadyZeroPower” still does not depend on size

# Getting “MeasuredOMA” consistently

- How do you measure the “size” of different shaped signals?
  - Comparing apples with oranges
- Different candidate metrics can work
  - Choice of metric depends where you are coming from
  - Different metrics can be “right”
- Important to automate so no error-laden input of “MeasuredOMA”
  - Candidate metrics can be automated

# Expect more news...

- Presentation by Tom Lindsay expected