# Tektronix

## Noise Measurements:
## more details re. ad-hoc on RINxOMA, others

### 802.3dj meeting in Montreal

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# Supporters

Contributors

- TBD

# Agenda

- Noise measurements: measurement flat area selection

- lallala

# Motivation

- The measurement of noise on 100+ GBd waveform is needed in several places – SNDR, RINxOMA, etc.

- Using the RINxOMA example from ad-hoc's presentation
"Noise measurement for RIN, re johnson_3dj_03a_2405" as an example, we show a practical noise measurement extraction

- This and other additional info are some of the information on what the instrumentation can do and what we can call "acceptable compensation" needs clarifying which this presentation will provide, see zivny_3dj_01a_2405 .

# Noise measurement

- In the original example there is no significant slope in the 'flat area' – the noise measurement across 2UI with one histogram is not impacted by a zero slope
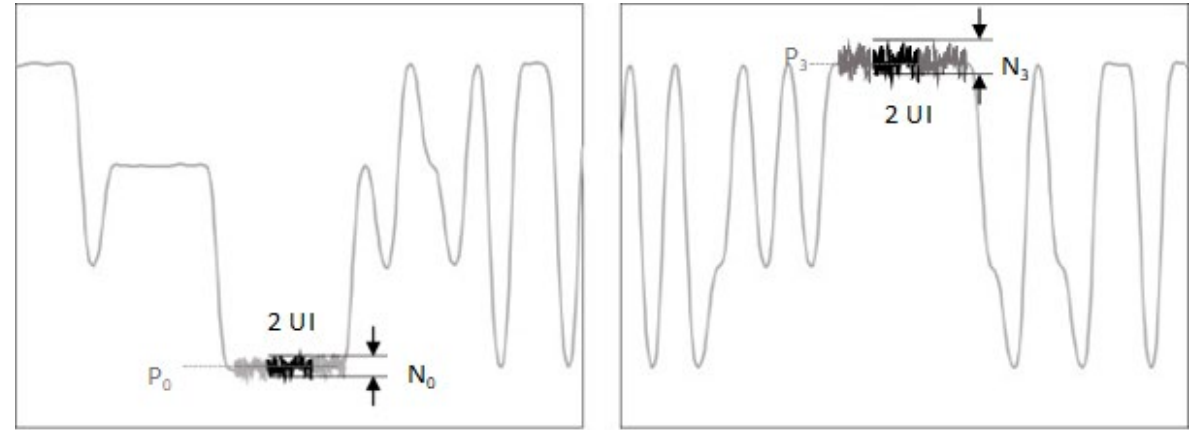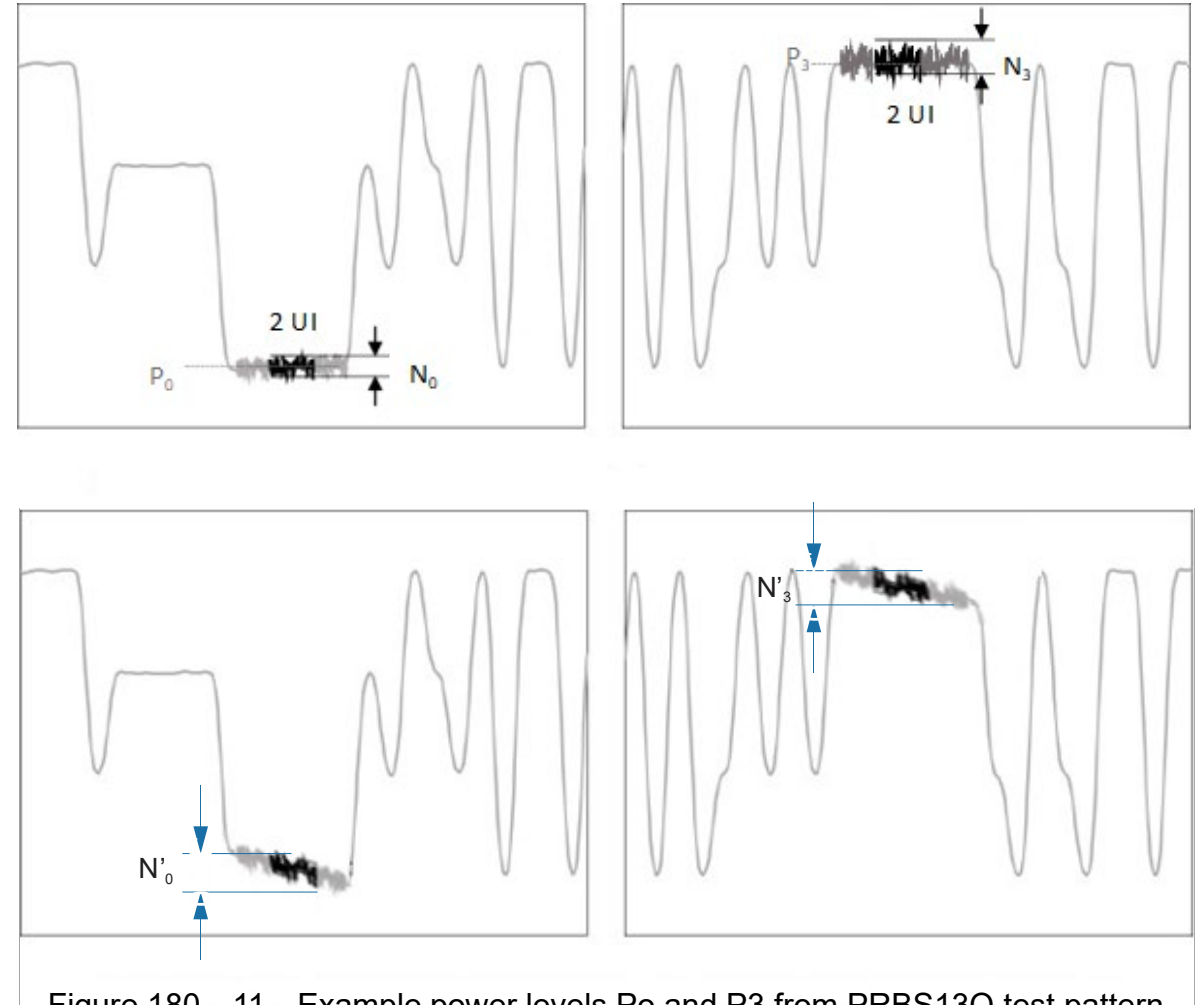


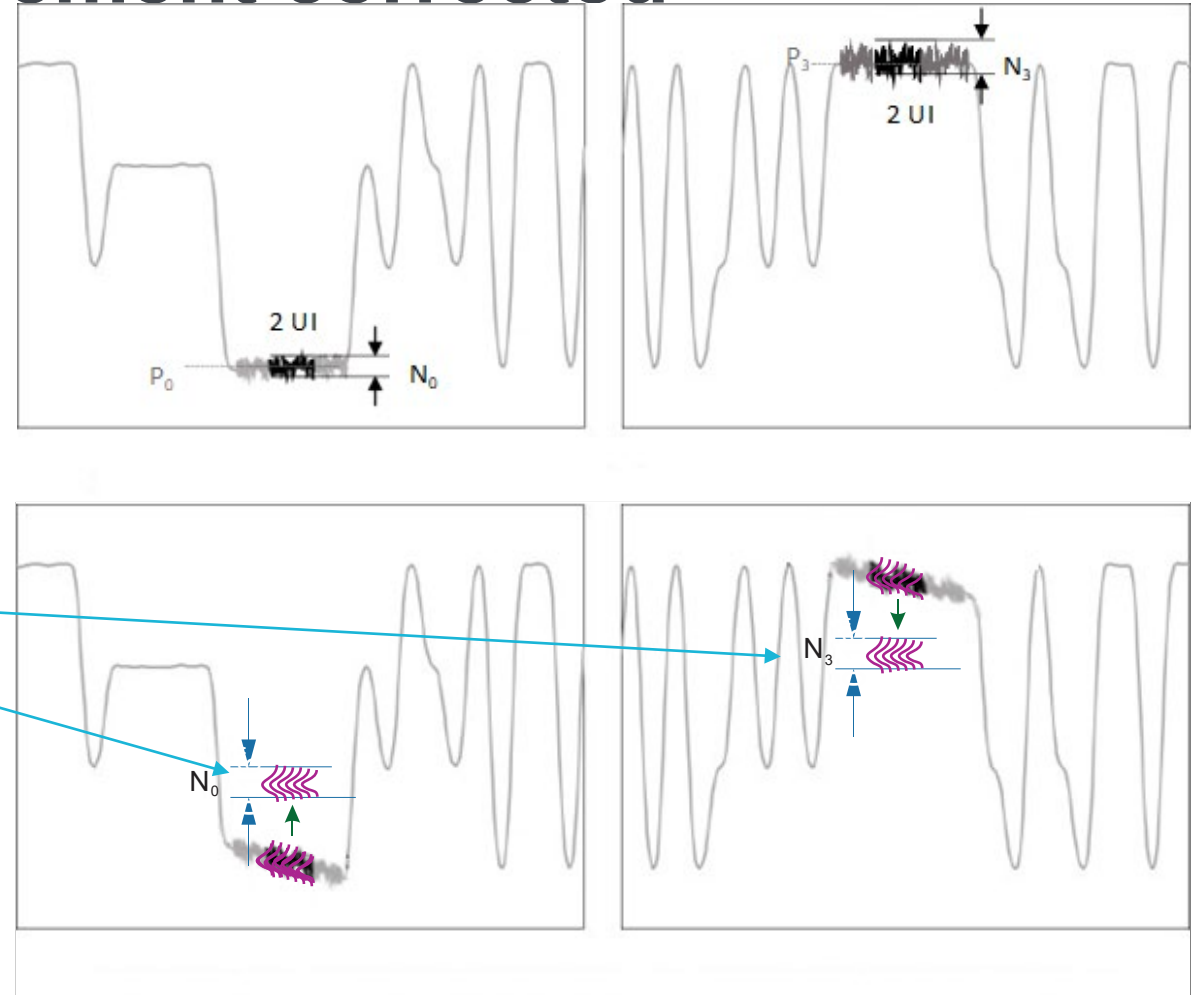Figure 180—11—Example power levels Po and P3 from PRBS13Q test pattern

# Noise measurement in presence of slope



Figure 180—11—Example power levels Po and P3 from PRBS13Q test pattern

- Compare the original (top right) to the picture on the right, where the signal exhibits slope over the flat areas: the sensitivity of the noise measurement to the slope of the 'flat area' is clearly visible; the measured 'noise' incorrectly appears higher

# Example of the noise measurement corrected for the slope of the 'flat area'

- Example of the corrected measurement:
  the distributions are collected in a sample-interval wide histograms;

- Then aligned by mean…

- … then measured (or measured separately, then combined; etc.)

# Acquisition method comment

- The 'aligned means' of narrow distribution can be additionally beneficial to sampling oscilloscopes, which might acquire the distribution area separately

- Although sampling oscilloscopes can acquire 0 width columns, in order to avoid local distribution minima it's desirable to acquire in several places or across a wider area
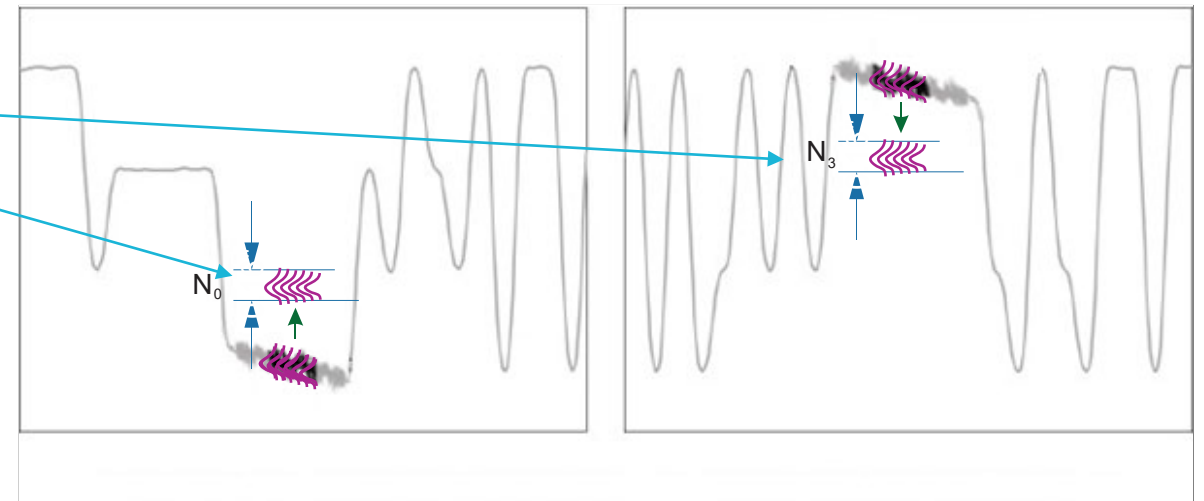


Figure 180—11—Example power levels Po and P3 from PRBS13Q test pattern

# Conclusion

- Example is given of a simple method for removing the impact of slope from the measurement of noise with histogram/histograms.

- Methods might differ between oscilloscope types slightly

- Several proposals were presented. These are to be further clarified and confirmed, and then confirmed by the group, e.g. in a strow call

- Thank you

-end.