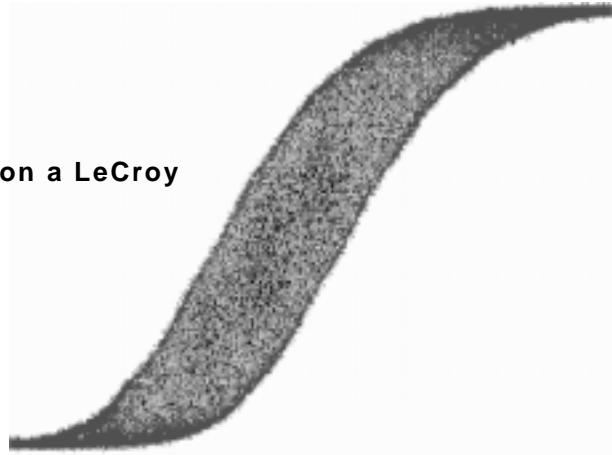


## To Trace Persistence

Display a Persistence waveform on a LeCroy color digital instrument.



From this waveform, create any of three types of shapes on which waveform processing can be performed.



*Average*

*Range*

*Sigma*



### An Innovative Visual AND Processing Tool

Persistence Trace (Per.Trace) empowers the instrument's Persistence display. With this Timing Function, not only can waveform noise and jitter be visualized, but further processing can be done — previously not possible with Persistence alone.

Per.Trace generates special graphic representations of the Persistence waveform on which further processing, such as the application of parameters and even PASS/FAIL testing, can be performed.

Displaying data acquired from multiple sweeps of the waveform, Per.Trace computes a vector trace based on the bit map of the underlying signal acquisitions. Detail is then shown in a choice of three shapes (*illustrated on the previous page*): “average”, “sigma” and “range”. These are created without destroying the underlying data, allowing visualization of analytical results from observation of raw data.

Typical applications and which of the three Per.Trace types to use for them are given in the table.

To...	Use Per.Trace...
See edge detail in a fast signal	<i>average</i>
Eliminate noise on a persistence trace	<i>average</i>
Assess “typical” noise on a persistence trace	<i>sigma</i>
Assess “worst case” noise on a persistence trace, and use it to create a tolerance mask	<i>range</i>



## Set Up and Configure for Per.Trace

There are two methods to create a Persistence Trace on the Jitter and Timing Analyzer. The easiest method is to use the Jitter Views toolbar's **ANALYSIS** button to access the **Analysis** menu. When this method is used, the Persistence Trace will be displayed on Trace C.

To configure and display Persistence traces on any trace, use the method below:

1. **Acquire a trace in Persistence mode, using Analog Persistence.**

MATH  
SETUP

2. Press  to display the ZOOM + MATH menus. They allow redefinition of any of the four traces, A, B, C and D and access their "SETUP" menus.
3. Press the  for "REDEFINE A", to configure the function — on Trace A for this example. Then select "**Per.Trace**" from the "Math Type" menu and use the menus shown here to create a Persistence Trace.

SETUP OF A

use Math?  
No Yes

Math Type  
Histogram  
Per.Hist  
Per.Trace  
Rescale  
Trend

type  
average  
sigma  
range

including  
98.0 %  
of population

pers of  
1 2 3 4  
B C D

### use Math?

To choose a math function.

### Math Type

For selecting "**Per.Trace**".

### type

To select the type of Persistence Trace: "**average**", "**sigma**" or "**range**".

### including/scale to

When "**range**" is selected, as in this example, a percentage of the population of the persistence map can be chosen from which the envelope will be formed, enabling exclusion of infrequent events (artifacts).

When "**sigma**" is highlighted, this becomes the "scale to" menu, which allows selection of a sigma factor of from 0.5–10.0. Expands those parts of the sigma envelope representing waveform regions with the most jitter.

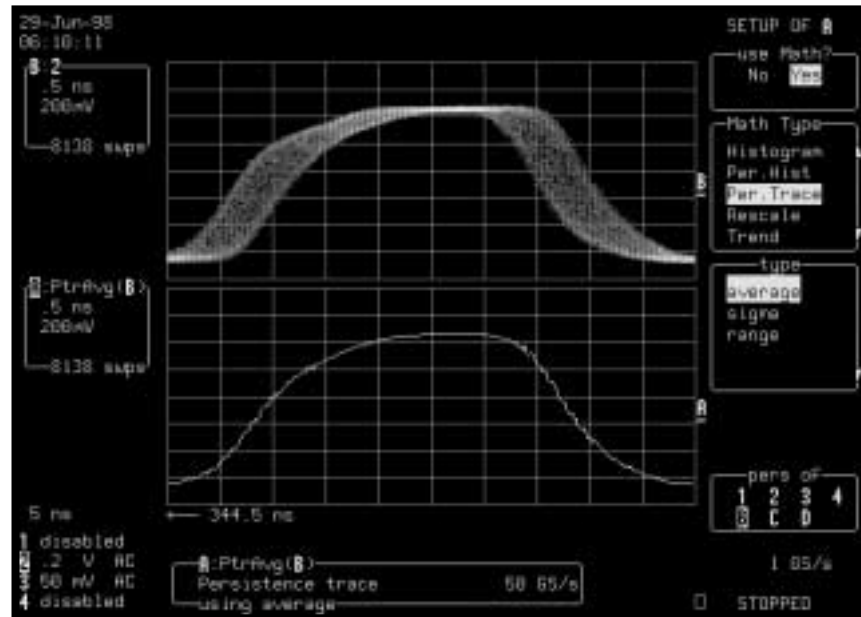
When "**average**" is selected, this menu does not appear at all.

### pers of

For selecting the source trace to which the Persistence Trace Function is to be applied.

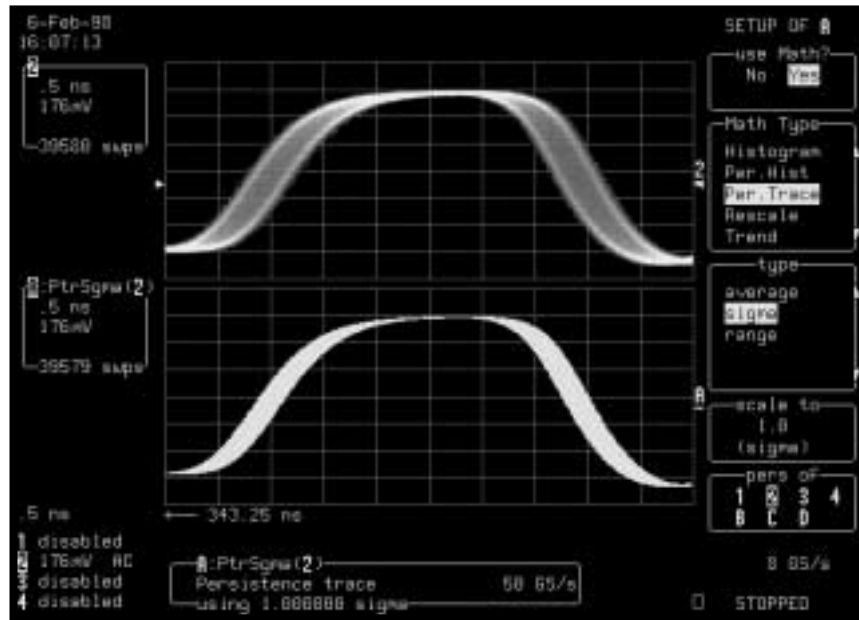


## How To Trace Persistence



**Persistence Trace: average.** For each vertical time slice on the persistence map, calculates and plots a trace corresponding to the map's mean value. Single-shot signals sampled at or above 2 GS/s and accumulated in the persistence map can be traced at a resolution of 10 ps (100 GS/s equivalent sampling). The Per.Trace average may be further analyzed using the instrument's standard parameters such as rise time.

## *sigma*

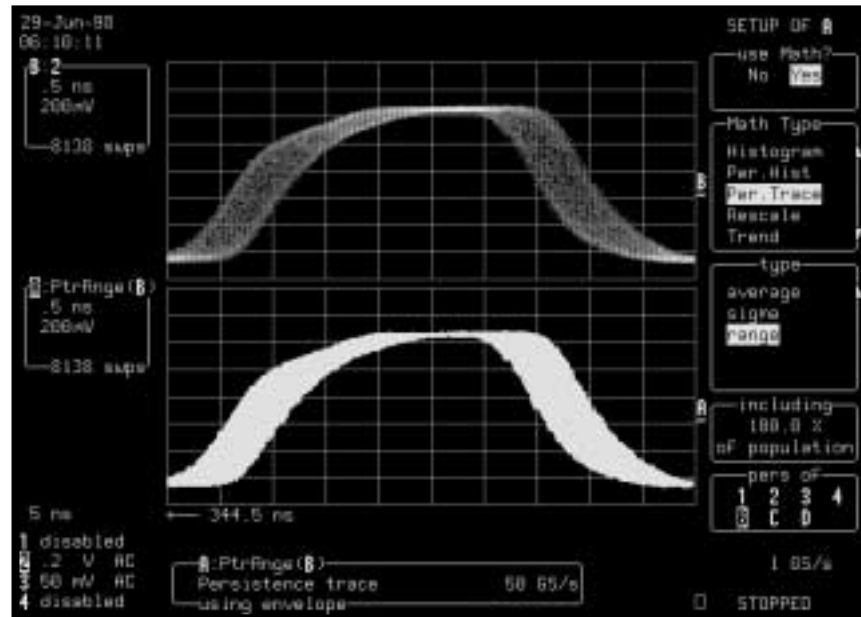


**Persistence Trace: sigma.** For each vertical time slice on the persistence map, calculates and plots an envelope corresponding to the map's standard deviation. Multiples of sigma can also be done using sigma.



## How To Trace Persistence

*range*



**Persistence Trace: range.** For each vertical time slice on the persistence map, calculates and plots an envelope corresponding to the map's range. The Per.Trace range can then be used in further processing: for example, as a source for Pass/Fail masks.

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