



# Dazscope

**Chirpscan measurement extension to Dazzler, ideal for OPA or kHz CPA.**

Invented by Fastlite in 2003, the Chirpscan technique is a perfect extension to a Dazzler for pulse compression optimization.

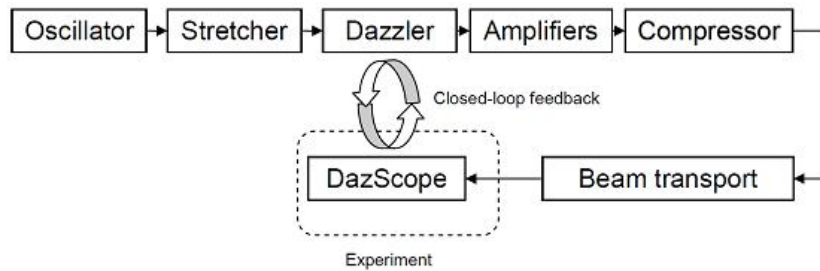
The large scanning range of the Dazzler allows to measure pulses with large time-bandwidth products, thus making it the ideal tool for the alignment and optimization of a compressor.

## **Principle - Key benefits**

- Implementation

The DazScope solution combines a Dazzler pulse shaper located upstream of the amplifier, and a compact optical head located after amplification, measuring the laser second harmonic spectrum (SHG spectrum). Alternatively, the Dazzler/Dazscope solution could be installed directly after an oscillator or a OPA/NOPA.

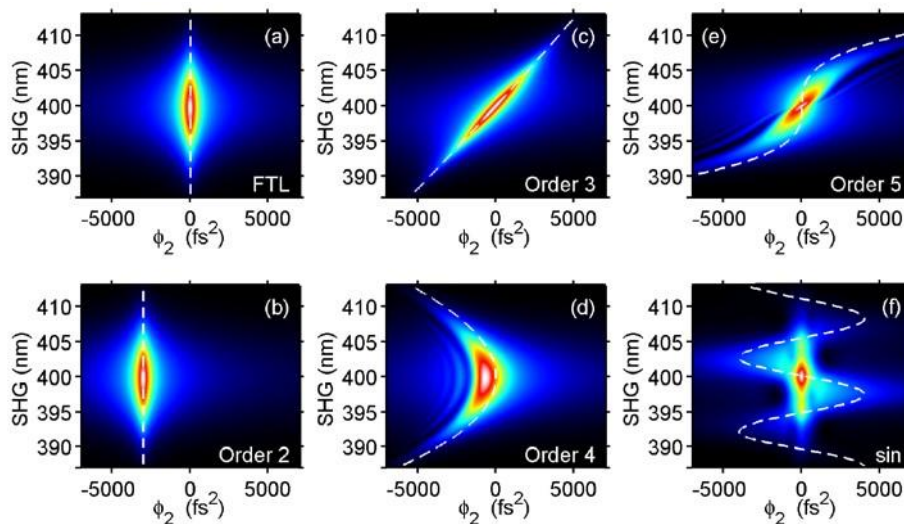
The measurement principle is as follow: the Dazzler is used to add pure second order phase to the pulse under characterization. The amount of chirp generated in the Dazzler is varied according to a well defined sequence, and the corresponding SHG spectra are recorded by the DazScope optical head. The DazScope software generates the proper chirp sequence and processes the recorded SHG spectra to retrieve the pulse spectral phase and intensity. In particular, second, third and fourth order phase terms are precisely determined within a few seconds.



- Phase correction

This measurement can be directly fed back to the Dazzler for proper flattening of the pulse spectral phase, or used as a guide to manually tweak compressor settings. The very intuitive traces provide a direct understanding of the polynomial phase order to correct.

Simulated Dazscope traces for FTL pulses and pure 2nd, 3rd, 4th, 5th order, and sinusoidal phase.



- Chirpscan versus other phase scanning techniques

The key factor in retrieving high fidelity high spectral resolution phase measurements with the DazScope is the Dazzler ability to produce large and accurate chirps.

Chirp scanning performed with moving dispersive materials also adds some higher order phase variations that need to be well calibrated to maintain the measurement accuracy.

The DazScope algorithm also uses quantitative chirp scans instead of sinusoidal phase scans, improving the measurement accuracy, and makes

use of the whole information contained in the observed SHG spectra instead of the sole maximum location, providing higher spectral resolution.

## **Applications**

- Pulse compression optimization

The Dazscope is a simple add-on to a Dazzler for kHz-rate CPA, OPA or NOPA compression optimization, or after an oscillator.

While the Chirpscan technique can not compete with the SRSI technique for measurement speed, accuracy, resolution and dynamic range, it can however measure large Time-Bandwidth product pulses and requires less energy.

## **Specifications**

Click on the image to download the 800nm Dazscope specifications.

Click on the image to download the visible Dazscope specifications.

For other wavelengths, please contact Fastlite.