Amplitude SYSTEMES

t-Pulse Duo

Dual diode pumped femtosecond oscillator

A new generation of ultrafast lasers

t-Pulse Duo is a dual compact femtosecond oscillator for pump-probe measurements

Pump-probe techniques are widely used to measure events on time scales much shorter than the resolution of electronic detectors, and are applied in such diverse fields as ultrafast spectroscopy, photo-acoustics, TeraHertz imaging, etc.

In **ultrafast photoacoustics** measurements, a pump beam launched in the sample acoustic waves, is detected by a second, temporally shifted probe beam. Typical detection methods rely on very small changes in the reflection coefficient of the sample surface, requiring an averaging of the signal to improve the signal to noise ratio.

Traditional pump-probe methods use a mechanical delay line to shift the two pulses in the time domain, where each measurement point corresponds to a single mechanical position of the delay line.

Although very efficient for small measurement ranges, extending this method in the hundreds of picoseconds or nanoseconds lead to a very long acquisition time, and unpractical length for the delay line.

t-Pulse Duo is a compact dual-oscillator ultrafast laser system, specifically designed for pump-probe measurements over time scales as long as 20 ns, with a sub-picosecond resolution. This system does not use any mechanical delay line, and allows for extremely fast acquisition time.

Features:

> Heterodyne optical sampling

> Simple and versatile pump-probe measurement system

> 20 ns time measurement window

> 1 W average power

> Dual-wavelength available

> 20 nJ per pulse

> Excellent pulse to pulse stability

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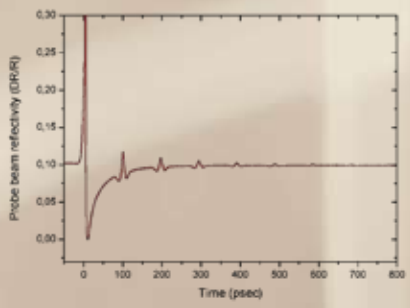
Application example:

Picosecond ultrasonics

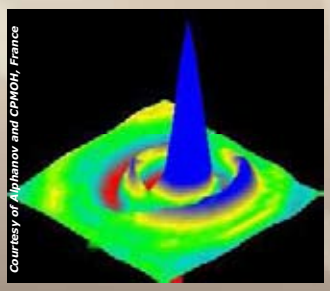


The result shown above is the photothermal response of a 250 nm Tungsten film deposited on an Al substrate measured with **t-Pulse Duo.**

The signal exhibits a typical fast behavior coming from the electronic response of the material followed by a slow thermal decay.

Superimposed with thermal background appear up to 8 acoustic echoes showing the longitudinal acoustic wave reflected back and forth in the Tungsten film.

The time of flight between successive echoes allows the determination of mechanical properties of the film while the thermal decay can be used to identify the thermal properties of nanomaterials.



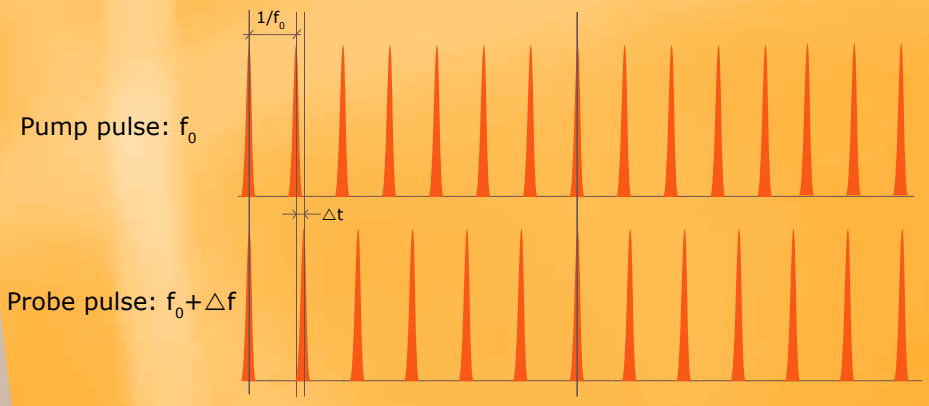
Surfaces Acoustic waves on a 250 nm Tungsten film on an Al substrate

Specifications:

	t-Pulse Duo
Average power	> 1 W
Pulse duration	< 200 fs
Pulse energy	20 nJ
Repetition rate	50 MHz
Wavelength	1030 nm
Dual wavelength	Optional (1030 nm / 515 nm)
Beam quality	TEM_{00}
Time measurement window	20 ns
Frequency offset tuning range	1 Hz to 10 kHz

Other specifications available on request. Please consult us.

Heterodyne optical sampling principle :



Dimensions :

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