SPIDER gives real-time pulse characterization

VENTEON LASER TECHNOLOGIES

Venteon Laser Technologies' pulse characterization system based on spectral phase interferometry for direct electric-field reconstruction (SPIDER) enables highly accurate and unique real-time ultrashort pulse characterization. It provides complete pulse reconstruction in both the time and frequency domain. Any experiment that uses ultrashort laser pulses with durations of only a few femtoseconds requires proper dispersion management to obtain transform-limited pulse durations at the interaction site. Venteon claims its SPIDER system is the most powerful technique for robust intensity profile and spectral phase characterization of ultrashort optical pulses. Compared with other ultrafast pulse characterization techniques, SPIDER does not rely on simple fits or use complex reconstruction algorithms, which are usually very time-consuming. Using SPIDER, the spectral phase information of the unknown laser pulse can be extracted by a robust, non-iterative and rapid phase-retrieval procedure in real time.

www.venteon.com

Autocorrelator suits wide power range

Femtochrome's FR-103HP is a compact nonlinear crystal autocorrelator that is suitable for moderate- to high-power lasers (that is, an average power of >5 mW). It is available with a scanning range of >60 ps (suitable for pulse widths of 10–15 ps) and covers a wide range of wavelengths with easily interchangeable plug-in detector modules. The standard FR-103HP provides the capability to monitor pulse widths in 'real time' for repetition rates down to 1 kHz. Pulse widths from lower repetition rate lasers are monitored and analyzed on a PC. Fibre-coupled lasers can be input using the fibre-coupled/free-space option, providing alignment-free operation. The standard non-collinear configuration, which provides a background-free autocorrelation of high dynamic range, can easily be changed to fringe-resolved operation using the interferometric/background-free option. Cross-correlation of two synchronized beams can be readily obtained using the cross-correlation option.

www.femtochrome.com

Cheetah infrared camera offers fast response

Belgian company Xenics claims its Cheetah-640CL camera is the fastest InGaAs infrared camera in the world. This unit is equipped with a dedicated high-speed InGaAs detector array that is sensitive up to wavelengths of 1.7 μm in the infrared and comes in 400- and 1,730-Hz speed versions. It allows users to visualize the ultrahigh-speed features of a specific research application. The camera head interfaces with a unique frame-grabbing system via two parallel CameraLink interfaces. The Cheetah-640CL is delivered with a software development kit that offers direct access to various camera settings and allows easy integration with a high-speed image-grabbing system. The Cheetah-640CL also offers the flexibility to use multiple C-mount lenses.

www.xenics.com

Femtosecond pulse shaping

The femtoFit from BioPhotonic Solutions is an ultrashort-pulse shaper that has three functions: accurate arbitrary pulse shaping, fast phase measurement and pulse compression to within 1% of the theoretical bandwidth limit. The shaper uses multiphoton intrapulse interference phase-scan technology to adaptively compensate for both linear and high-order phase distortions such as those introduced by optics, microscope objectives and dielectric mirrors. It is a compact (15 cm × 15 cm × 15 cm) cube that can be integrated into an existing beam path in as little as five minutes. The push-button compression function automatically measures and compresses a pulse to its bandwidth limit duration within seconds. Its ability to adaptively compensate for both linear and high-order phase distortions is particularly useful when elements in the optical setup are changed, for example when using different objectives for imaging or machining applications. The femtoFit can be inserted between the oscillator and amplifier to optimize the amplifier's laser output. Besides pulse compression, the system provides pulse characterization and shaped-pulse synthesis. Its compactness makes the femtoFit ideal for any laboratory setting and avoids the need for tedious manual tweaking.

www.biophotonicsolutions.com

Ultrafast laser features robust mode-locking

TOPTICA

Toptica has introduced the FemtoFiber pro ultrafast laser. The basic all-fibre laser system (FemtoFiber pro IR) emits pulses at 1,560 nm with a pulse width below 100 fs and an average power that exceeds 350 mW. The standard repetition rate is 80 MHz, but 40 MHz or custom frequencies can also be selected. The use of a saturable absorber mirror ensures self-starting and stable mode-locking under all laboratory conditions. Furthermore, all fibre components are polarization-maintaining, making the laser robust against environmental changes. The system can be easily accessed via common communication interfaces (Ethernet, USB or RS232), providing the user with control over many functions such as pulse width. Three models of the FemtoFiber pro are available: the fundamental output at 1,560 nm (FemtoFiber pro IR), the second harmonic at 780 nm (FemtoFiber pro NIR) and an octave-spanning supercontinuum ranging from 980 nm to 2,200 nm (FemtoFiber pro SCIR). All models come in a single box with a compact A4-size footprint. For convenience, the second-harmonic generation model features a manual switch between 780 nm and 1,560 nm without the need for any re-alignment. Up to three fibre-coupled seed ports turn the FemtoFiber pro into a complex laser system for multicolour experiments with optically synchronized laser pulses. The FemtoFiber pro serves as a reliable performer for many applications such as life sciences, time-domain terahertz and ultrafast spectroscopy, metrology and optical coherence tomography.

www.toptica.com