Clark-MXR, Inc.

NOPA

Non-collinear Optical Parametric Amplifier for CPA-Series

Innovative Ultrafast Laser Solutions

ADVANTAGES

- Optimized to be pumped by the Clark-MXR, Inc. CPA-Series Fiber seeded Ti:Sapphire regenerative amplifiers
- Pulses as short as 14fs1
- Near TEM00 output mode
- Compact, user-friendly design
- White light continuum seeded for high stability
- High beam quality
- Can be customized to user requirements/reconfigurable

APPLICATIONS

- Pump-probe spectroscopy/ microscopy
- CARS spectroscopy/ microscopy
- High S/N pump/probe spectroscopy and microscopy
- Terahertz spectroscopy
- Photoelectron spectroscopy/ microscopy
- 2D spectroscopy
- Ultrafast electron microscopy

NOPA is a white light continuum seeded, non-collinear, optical parametric amplifier capable of generating extremely short pulses when pumped by the Clark-MXR, Inc. CPA-Series fiber seeded Ti:Sapphire regenerative amplifier. To generate short pulses a fraction (~200-250mW) of the output beam of the CPA-Series laser is split into two beams inside the NOPA enclosure. One beam is used to generate an extremely broad continuum seed beam which is then amplified by the second, higher intensity beam from CPA-Series laser in a BBO crystal operated in a non-collinear arrangement.

Non-collinear amplification is extremely efficient and preserves the very broad bandwidth of the seed beam, which can then be compressed to a pulsewidth as short as 14fs1 in a prism or chirped mirror compressor. Non-collinear amplification is preferred since the resulting pulsewidth is dependent only on the bandwidth of the seed and not on the pulsewidth of the pump laser. In fact, conversion efficiency is improved by having a longer, rather than shorter, pump pulse because there is more temporal overlap between the two beams.

Specifications:

	NOPA-Slim	NOPA	NOPA-Plus
Tuning Range	470-700nm 1100 to >1300nm	450-700nm 870-1600nm	450-1600nm gap-free
Max Pulse Energy (when pumped with 200uJ from CPA-Series laser)	up to 7uJ	up to 8uJ	up to 8uJ
Repetition Rate	up to 2kHz, laser dependent	up to 5kHz, laser dependent	
Transverse Mode	near TEM00		
Noise	<1% RMS for rep rates >2Hz		
Electrical/Cooling	none		
Polarization	Linear, horizontal		

Notes:

- Custom configurations available
- OPA design with bandwidth restriction available for CARS spectroscopy/microscopy
- Only 250uJ is needed to pump NOPA, thus several NOPAs can be pumped simultaneously
- Optional second harmonic generation modules are also available to extend the tuning range
- Available, optional chirped-mirror compressor
- 1T. Wilhelm, J. Piel, and E. Riedle, "Sub-20-fs pulses tunable across the visible from a blue-pumped single-pass noncollinear parametric converter," Opt. Lett. 22, 1494-1496 (1997)

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