

Innovative Ultrafast Laser Solutions

iNOPA

Non-collinear Optical Parametric Amplifier for Model IMPULSE-Series

ADVANTAGES

- Optimized to be pumped by the Clark-MXR, Inc. Model IMPULSE and IMPULSE-HE Yb-doped fiber Oscillator/ 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/configurations
- Tuning ranges from 200nm to 6micron

APPLICATIONS

- Pump-probe spectroscopy/ microscopy
- CARS spectroscopy/ microscopy
- High S/N pump-probe spectroscopy & microscopy
- Photoemission spectroscopy/ microscopy (PEEM/ARPES)
- 2D spectroscopy
- Ultrafast electron microscopy



Model iNOPA is a white light continuum seeded, non-collinear, optical parametric amplifier capable of generating extremely short pulses when pumped by the Clark-MXR, Inc. Model IMPULSE or IMPULSE-HE Yb-doped Fiber Oscillator/Amplifier. To generate short pulses, the output beam of the pump laser is split into two beams inside the Model iNOPA enclosure. One beam is used to generate an extremely broad continuum seed beam which is then amplified by the second, higher intensity beam from IMPULSE in a BBO crystal operated in a non-collinear arrangement.

Non-collinear amplification 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 for extremely short pulse generation 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 overlap in time between the two beams.

Specifications:

	iNOPA & iNOPA-Duo (SHG)	iNOPA-Duo SHG/THG	iNOPA-UV
Tuning Range	650-1000nm 1100 to >1300nm	490-680nm 650-1000nm	200-1000nm
Max Pulse Energy (when pumped with 10 μ J from Model IMPULSE)	>250nJ	>250nJ	Varies according to the configuration
Repetition Rate	up to 5MHz	up to 5MHz	up to 2MHz
Transverse Mode	near TEM00		
Noise	<1% RMS for rep rates >2Hz		
Electrical/Cooling	none		
Polarization	Linear, horizontal		

Notes:

- Er-doped, frequency doubled fiber seed oscillator
- Electronic shutter for pulses on demand and burst mode
- Optional oscillator output at 1550nm and 775nm
- Optional harmonic generation modules (Model STORC) are available
- Can pump several NOPAs for tunable output between 400-1600nm providing pulse duration down to 14fs (T. 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, 1997)
- 1-year system warranty with 5-year full replacement warranty on oscillator



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