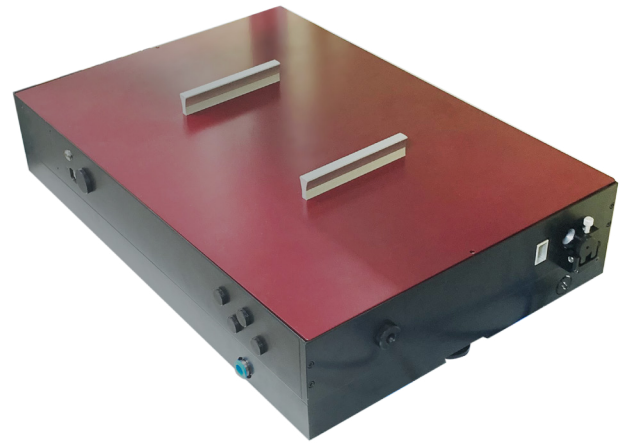




## PARUS. Ultrafast Optical Parametric Amplifier

- Available wavelengths from 320 nm up to 10  $\mu\text{m}$
- Up to 3 mJ input pump pulse energy
- Up to 10% signal+idler typical conversion efficiency
- <250 fs typical pulse duration
- Harmonic generators, SFG, DFG add-ons available
- Thermally stabilized body
- Fully automated tuning with PC software

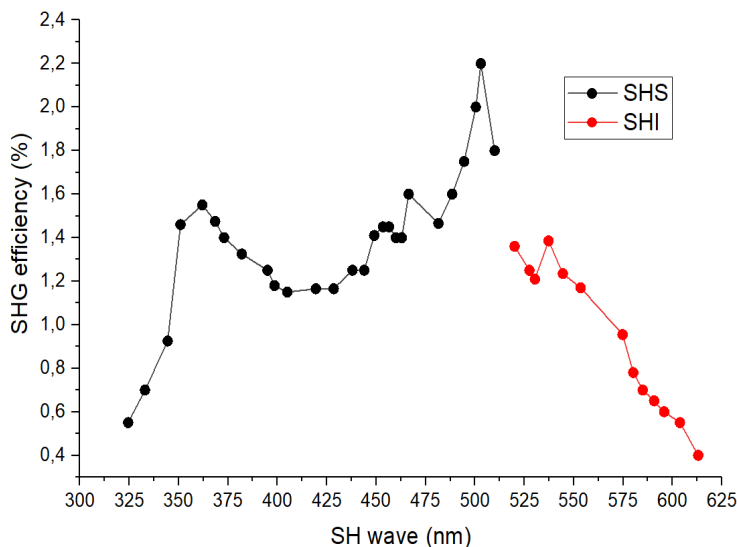


PARUS-NE-515 optical head

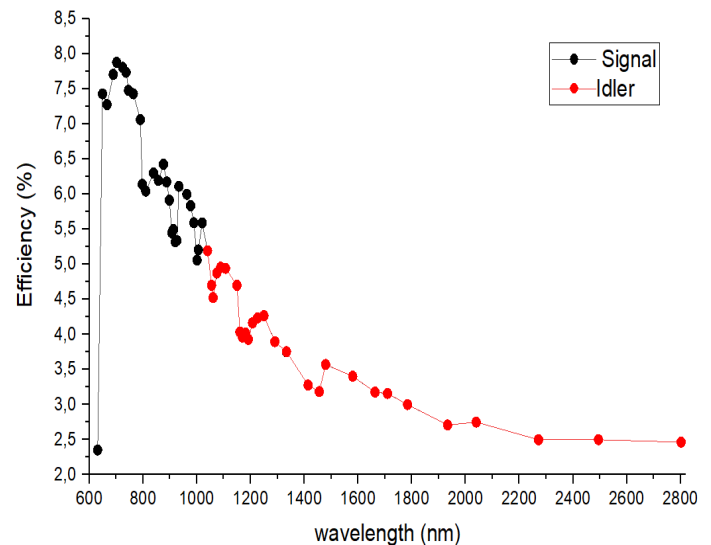
### Product overview

The PARUS femtosecond optical parametric amplifier (OPA) is designed as a robust automated wavelength conversion tool with broad wavelength tuning. The units can be pumped either by a Ti:S REUS amplifier series (at  $\sim 800$  nm) or by Yb ANTAUS or TETA series (at  $\sim 1030$  nm).

Certain OPA models include a built-in SHG module for pump beam conversion in order to offer higher energy in the VIS and NIR ranges, while some models are pumped by a fundamental pump beam offering broader coverage and higher pulse energy in the MIR range and DFG applications. The system is fully automated and is offered with a Windows PC software for wavelength tuning.



Typical tuning curve of optional SHG module of the PARUS-NE-515 (for reference only); efficiency given with 400  $\mu\text{J}$  input pump energy at 1030 nm.



Typical tuning curve of the PARUS-NE-515 (for reference only); efficiency given with 400  $\mu\text{J}$  input pump energy at 1030 nm.

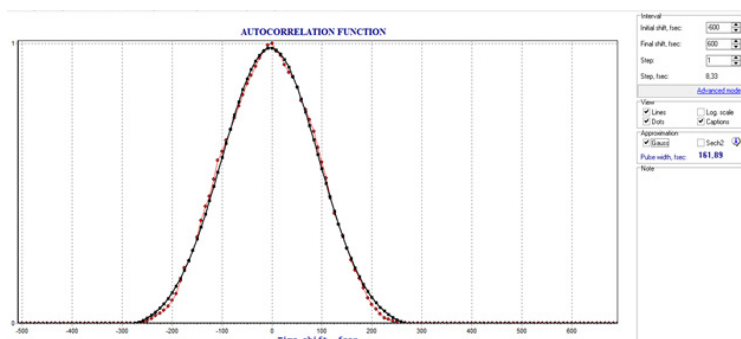


	PARUS-515	PARUS-800	PARUS-1030
<b>Signal output tuning range</b>	640-1020 nm	1200-1600 nm	1400-2000 nm
<b>Idler output tuning range</b>	1040-2600 nm	1600-2400 nm	2100-4000 nm
<b>Conversion efficiency of pump input (S+I, at peak of tuning curve)</b>	>10%	>10%	>10%
<b>Output pulse duration<sup>1)</sup></b>	<1x of pump	<1.5x of pump	<1x of pump
<b>Pump laser specifications<sup>2)</sup></b>			
<b>Max. pump average power</b>	8 W at 1030 nm	2.5 W at 800 nm	8 W at 1030 nm
<b>Pump pulse energy</b>	0.2...2 mJ	0.2...3 mJ	0.2...2 mJ
<b>Suitable pump laser</b>	TETA Yb series	REUS Ti:S series	TETA Yb series
<b>Pump pulse duration</b>	250-300 fs	35-100 fs	250-300 fs
<b>Additional outputs</b>			
<b>Full pump SHG output (switchable)</b>	yes, ~50% eff.	n/a	n/a
<b>Depleted pump fundamental after SHG</b>	yes	n/a	n/a
<b>Depleted pump after OPA</b>	yes, pump SHG	yes, pump fund.	yes, pump fund.
<b>Available optional extension modules<sup>3)</sup></b>			
<b>Sum frequency 1 (SFS)</b>	data on request	480-533 nm (3%)	data on request
<b>Sum frequency 2 (SFI)</b>	data on request	533-600 nm (1.5%)	data on request
<b>Second harmonic of signal (SHS)</b>	320-510 nm (2%)	600-800 nm (2%)	data on request
<b>Second harmonic of idler (SHI)</b>	520-650 nm (2%)	800-1200 nm (2%)	data on request
<b>Difference frequency (DFG1)</b>	3000-9000 nm (0.8%)	2700-4500 nm (0.5%)/ 4500-10000 nm(0.2%)	data on request
<b>Environmental and utility specifications</b>			
<b>Operating conditions</b>	18-25 °C; RH <60%, non-condensing		
<b>Voltage</b>	single-phase; 100-240 V AC; 50/60 Hz		
<b>Physical dimensions (LxWxH)</b>			
<b>OPA optical head</b>	510×345×110 mm (without external periscope)		
<b>SHG extension (optional)</b>	480×260×105 mm (SHS and SHI)		

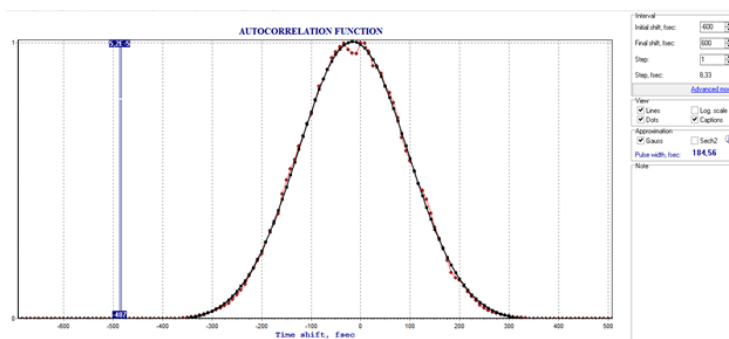
1) - depends on input pump pulse duration and output central wavelength;

2) - exact value or certain range must be confirmed, please contact us for details; customized solutions are available upon request;

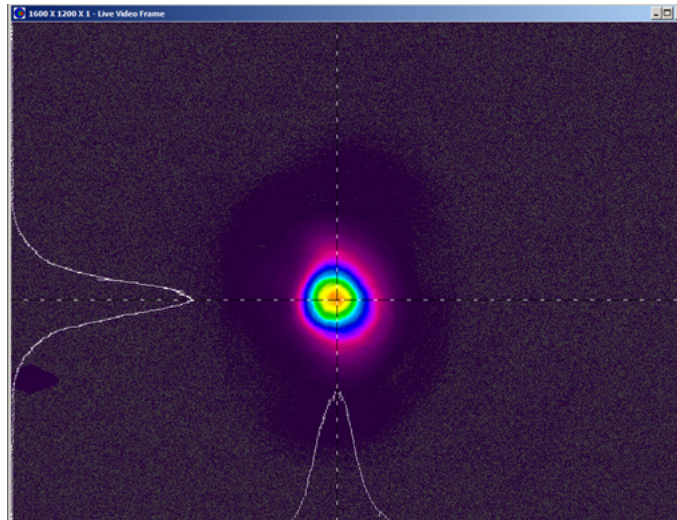
3) - possible tuning ranges with typical peak conversion efficiency to pump pulse energy given in brackets; please ask for a quote for exact values



PARUS-NE-515 signal output typical ACF at 702 nm  
(pulse duration 162 fs)

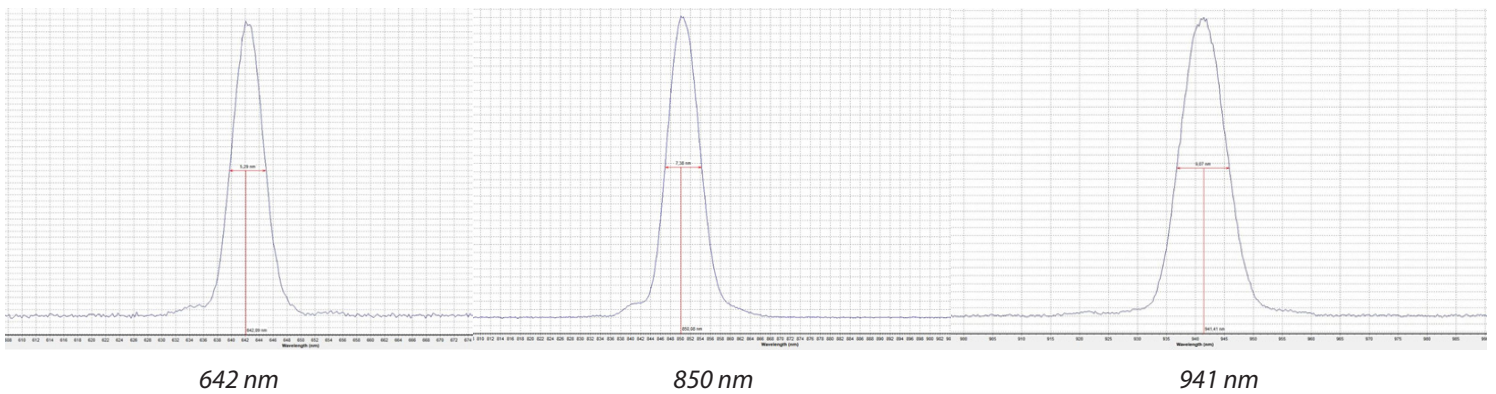


PARUS-NE-515 signal output typical ACF at 901 nm  
(pulse duration 185 fs)



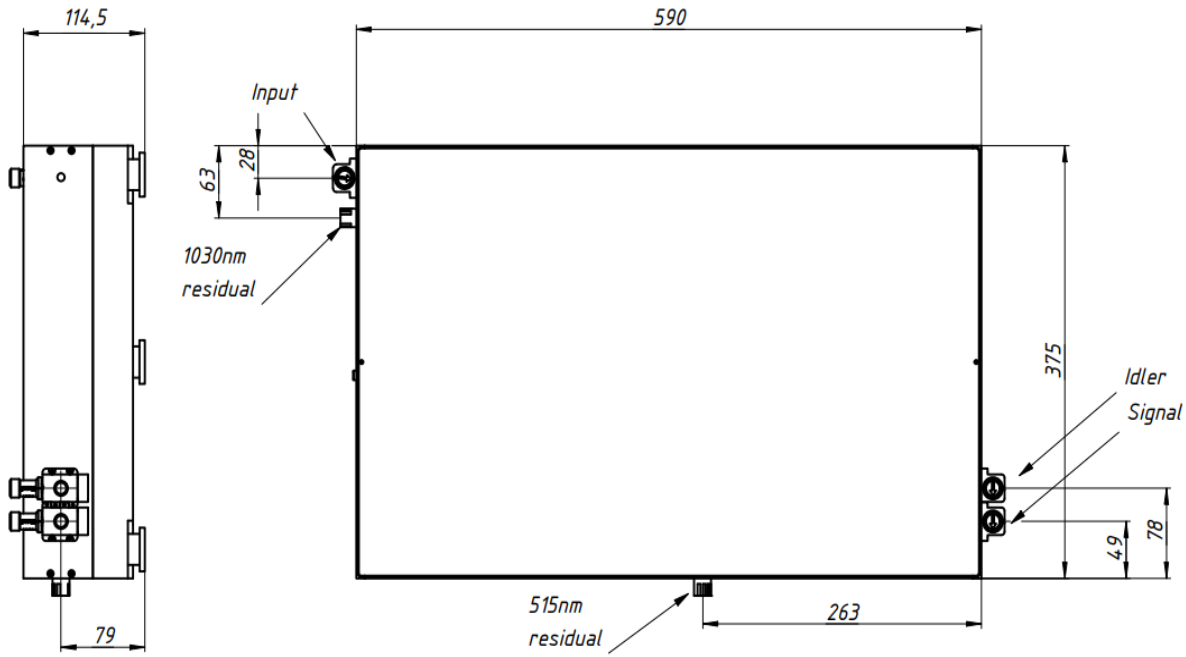
PARUS-NE-515 signal beam profile at 800 nm

PARUS-NE-515 signal beam spectrum during tuning



PARUS software

Signal (nm)	IDLER (nm)	Delay 1	Delay 2	NC 1	NC 2
630	2821,30434782609		12400	12350	4090
640	2636,8		12245	12340	3970
661	2331,6095890411		11945	12325	3878
697	1972,28021978022		11545	12300	3730
727	1766,06132075472		11245	12287	3679
765	1575,9		10945	12272	3628
779	1519,64015151515		10845	12267	3553
794	1465,62724014337		10745	12260	3565
819	1387,45065789474		10595	12255	3576
847	1313,87048192771		10445	12245	3558
867	1268,48011363636		10345	12245	3560
890	1222,26666666667		10245	12245	3554
908	1189,8727735369		10175	12240	3550
935	1146,4880952381		10075	12240	3523
951	1123,31422018349		10025	12230	3520
974	1092,83224400871		9945	12250	3534
1000	1061,85567010309		9825	12225	3580
1022	1038,12623274162		9765	12240	3457



PARUS-NE-515 outline drawing (w/out external input beam periscope)