



PARUS. Ultrafast Optical Parametric Amplifier

- Available wavelengths from 320 nm up to 10 μm
- 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

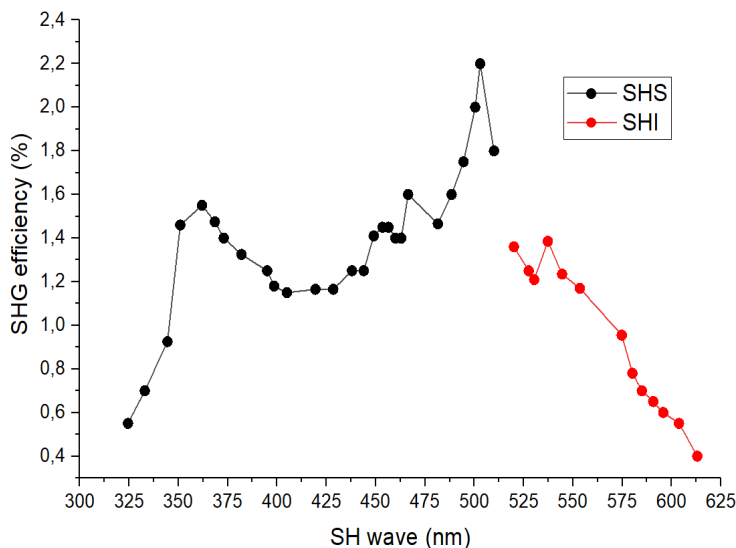


PARUS-NE-515 optical head

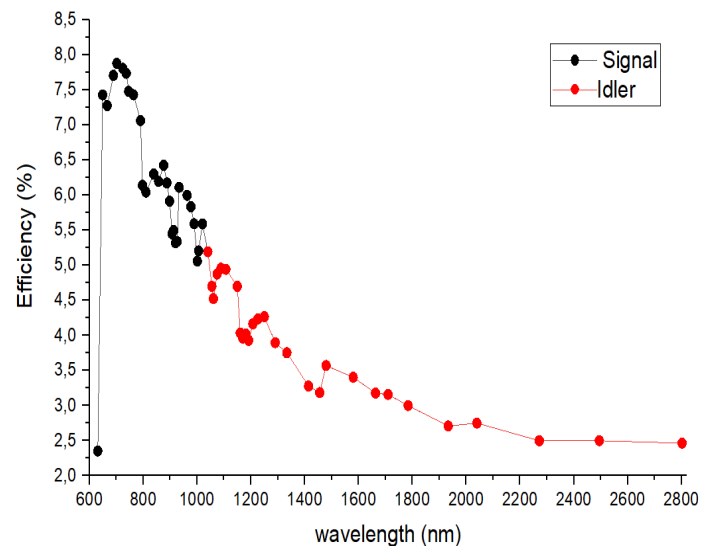
Product overview

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 ~ 800 nm) or by Yb ANTAUS or TETA series (at ~ 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 μJ input pump energy at 1030 nm.



Typical tuning curve of the PARUS-NE-515 (for reference only); efficiency given with 400 μJ input pump energy at 1030 nm.

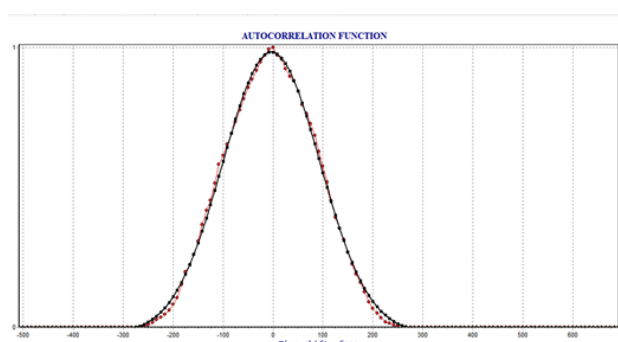


	PARUS-515	PARUS-800	PARUS-1030
Signal output tuning range	630-1020 nm	1200-1600 nm	1400-2000 nm
Idler output tuning range	1040-2800 nm	1600-2400 nm	2100-4000 nm
Conversion efficiency of pump input (S+I, at peak of tuning curve)	>10%	>10%	>10%
Output pulse duration¹⁾	<1x of pump	<1.5x of pump	<1x of pump
Pump laser specifications²⁾			
Max. pump average power	8 W at 1030 nm	2.5 W at 800 nm	8 W at 1030 nm
Pump pulse energy	0.2...2 mJ	0.2...3 mJ	0.2...2 mJ
Suitable pump laser	TETA Yb series	REUS Ti:S series	TETA Yb series
Pump pulse duration	250-300 fs	35-100 fs	250-300 fs
Additional outputs			
Full pump SHG output (switchable)	yes, ~50% eff.	n/a	n/a
Depleted pump fundamental after SHG	yes	n/a	n/a
Depleted pump after OPA	yes, pump SHG	yes, pump fund.	yes, pump fund.
Available optional extension modules³⁾			
Sum frequency 1 (SFS)	data on request	480-533 nm (3%)	data on request
Sum frequency 2 (SFI)	data on request	533-600 nm (1.5%)	data on request
Second harmonic of signal (SHS)	320-510 nm (2%)	600-800 nm (2%)	data on request
Second harmonic of idler (SHI)	520-650 nm (2%)	800-1200 nm (2%)	data on request
Difference frequency (DFG1)	data on request	2700-4500 nm (0.5%)/ 4500-10000 nm(0.2%)	data on request
Environmental and utility specifications			
Operating conditions	18-25 °C; RH <60%, non-condensing		
Voltage	single-phase; 100-240 V AC; 50/60 Hz		
Physical dimensions (LxWxH)			
OPA optical head	510×345×110 mm (without external periscope)		
SHG extension (optional)	480×260×105 mm (SHS and SHI)		

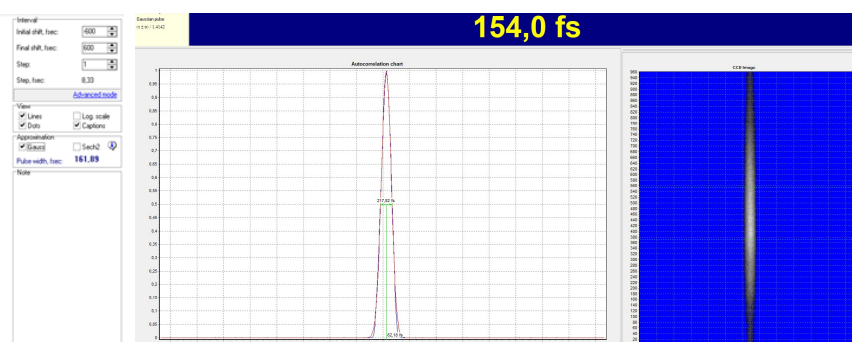
1) - depends on input pump pulse duration and output central wavelength;

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

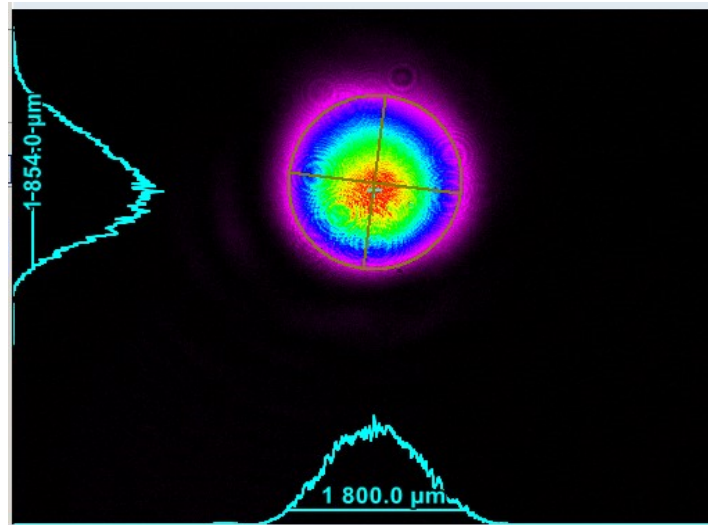
3) - possible tuning ranges with typical peak conversion efficiency to pump pulse energy given in brackets; please ask for a quote for exact values



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

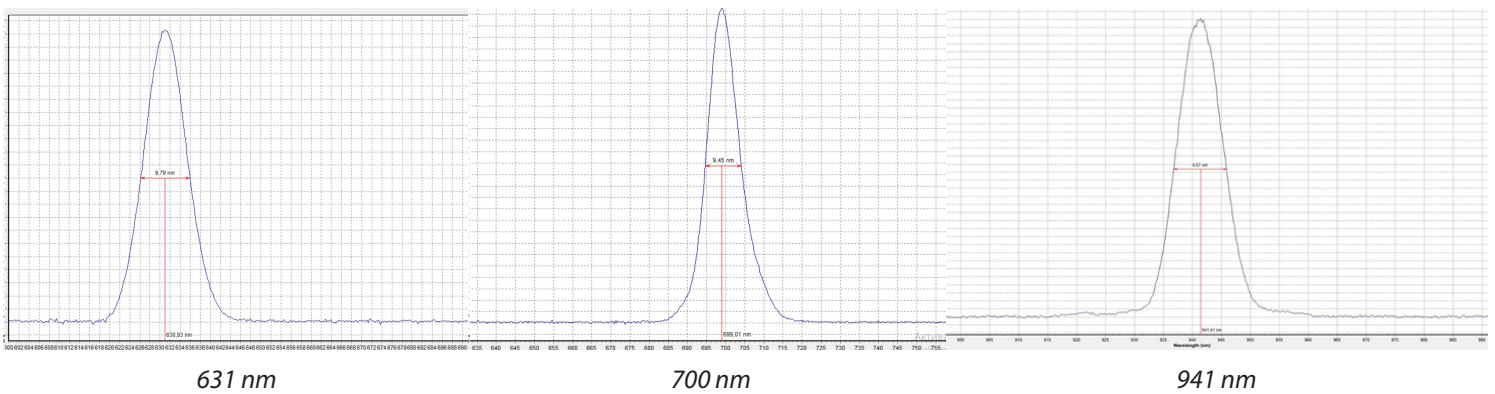


PARUS-NE-515 signal output typical ACF at 840 nm (pulse duration 154 fs)



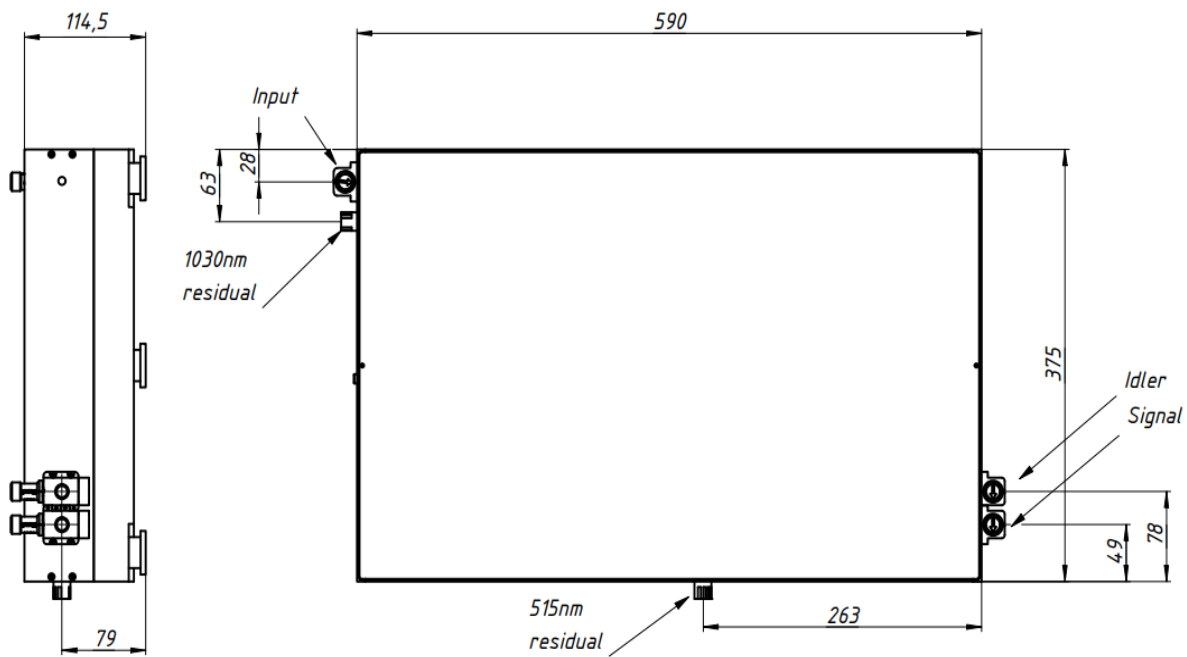
PARUS-NE-515 signal beam profile at 744 nm

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	1942
640	2636,8	12245	12340	3970	1939
661	2331,6095890411	11945	12325	3878	1906
697	1972,28021978022	11545	12300	3730	1795
727	1766,06132075472	11245	12287	3679	1701
765	1575,9	10945	12272	3628	1595
779	1519,64015151515	10845	12267	3553	1551
794	1465,62724014337	10745	12260	3565	1530
819	1387,45065789474	10595	12255	3576	1470
847	1313,87048192771	10445	12245	3558	1428
867	1268,48011363636	10345	12245	3560	1410
890	1222,26666666667	10245	12245	3554	1386
908	1189,872735369	10175	12240	3550	1370
935	1146,4880952381	10075	12240	3523	1353
951	1123,31422018349	10025	12230	3520	1343
974	1092,83224400871	9945	12250	3534	1341
1000	1061,85567010309	9825	12225	3580	1340
1022	1038,12623274162	9765	12240	3457	1341



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