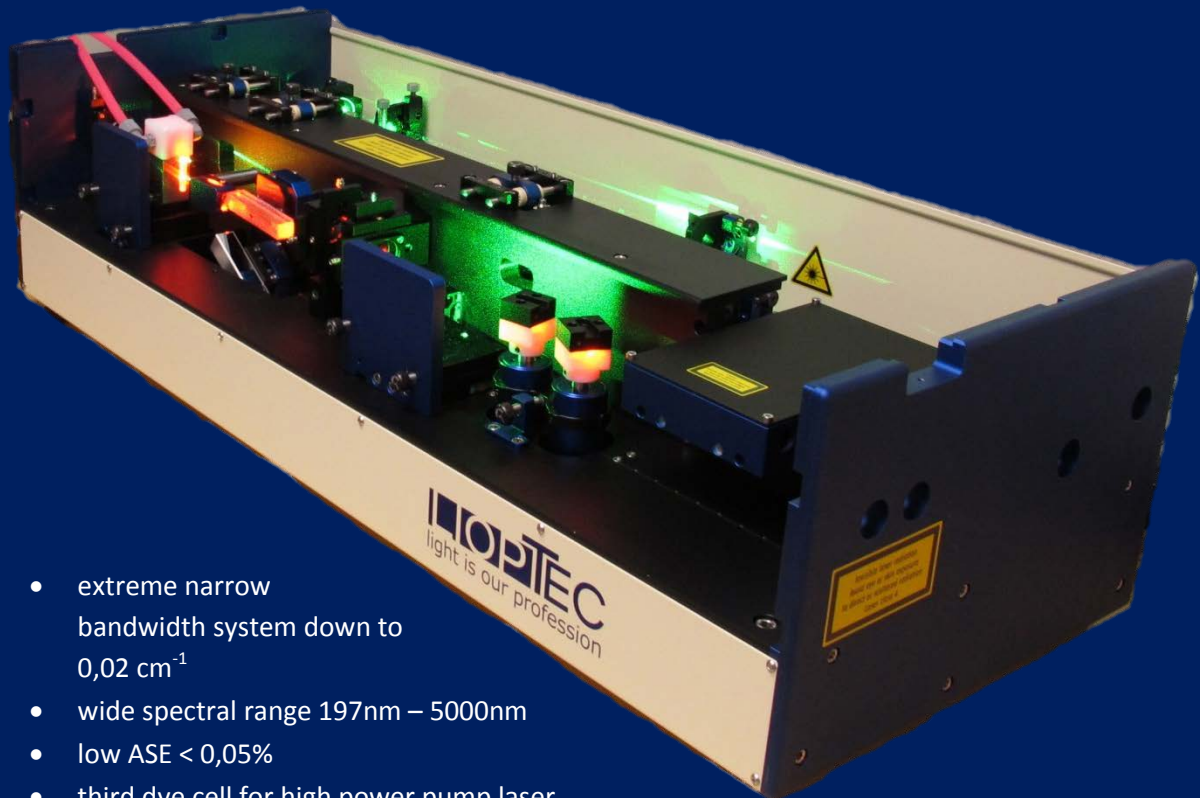


Pulsed Dye Laser

LIOPSTAR & LIOPSTAR-E



- extreme narrow bandwidth system down to $0,02 \text{ cm}^{-1}$
- wide spectral range 197nm – 5000nm
- low ASE < 0,05%
- third dye cell for high power pump laser
- highly efficient laser resonator
- near Gaussian beam quality due to Bethune cells
- eroded stainless steel case for oscillator and amplifier cells
- new state-of-the-art integrated electronics and user friendly LabView Software
- intelligent PI control for FCU autotracking unit
- temperature stabilized crystals
- USB port
- remote control via TCP / IP protocol
- smallest footprint

Application:

- laser induced fluorescence: LIF
- combustion and atmospheric studies
- Raman spectroscopy
- and much more
- photolysis
- light detection and ranging: LIDAR
- coherent anti-Stokes Raman spectroscopy: CARS

Options

frequency conversion units

- internal open loop frequency doubling with look-up-table
- internal open loop frequency tripling and mixing with look-up-table¹
- autotracking² FCU available for second-harmonic generation (SHG), third-harmonic generation (THG)¹, sum- and difference frequency mixing (SFM, DFM)^{1,3}
- intelligent PI-control corrects phase matching deviation of the look-up-table algorithm during wavelength scans and temperature changes
- high scan speed, up to 10 nm/min
- usable for repetition rates from < 1 Hz up to 100 kHz
- temperature control for doubling crystal
internal BBO temperature control can be set up to 70°C

energy output

| dye | UV/IR wavelength | pump energy @ 10Hz | dye laser | output energy |
|--|------------------|--------------------|---------------|---------------|
| SHG 206 nm – 450 nm | | | | |
| Coumarin 120 | 220 nm | 280 mJ @ 355 nm | LIOPSTAR-VN | > 5 mJ |
| Coumarin 307 | 250 nm | 280 mJ @ 355 nm | LIOPSTAR-VN | > 5 mJ |
| Rhodamine 6G | 280 nm | 400 mJ @ 532 nm | LIOPSTAR-VN | > 25 mJ |
| DCM | 320 nm | 400 mJ @ 532 nm | LIOPSTAR-VN | > 25 mJ |
| THG¹ 197 nm – 212 nm | | | | |
| Rhodamine B | 200 nm | 400 mJ @ 532 nm | LIOPSTAR-VN | 2 mJ |
| Rhodamine 101 | 205 nm | 400 mJ @ 532 nm | LIOPSTAR-VN | 4 mJ |
| DCM | 210 nm | 400 mJ @ 532 nm | LIOPSTAR-VN | 4 mJ |
| DFM^{1,3} 1.4 μm – 5.0 μm | | | | |
| DCM | 1.6 μm | 400 mJ @ 532 nm | LIOPSTAR-E-VN | 6 mJ |
| Pyridine1 | 2.0 μm | 400 mJ @ 532 nm | LIOPSTAR-E-VN | 5.5 mJ |
| Styryl 9 | 3.4 μm | 400 mJ @ 532 nm | LIOPSTAR-E-VN | 800 μJ |
| LDS 867 | 4.7 μm | 400 mJ @ 532 nm | LIOPSTAR-E-VN | 100 μJ |

¹ THG, SFM and DFM operation requires a LIOPSTAR-E with LSEH extension

² wavelength separation is required for autotracking operation

³ for narrowband operation a seeder for the Nd:YAG pump laser is recommend

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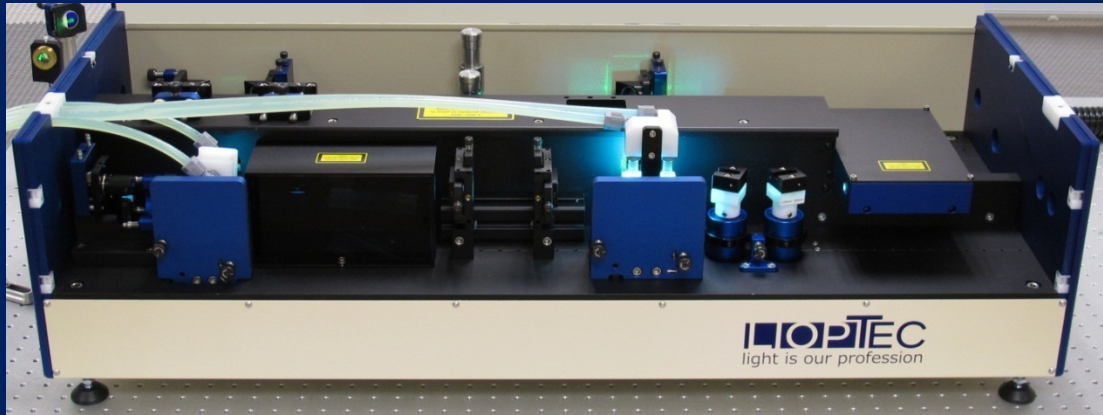
| linewidth specifications | | LIOPSTAR / LIOPSTAR-E | |
|--|--|----------------------------|----------------------------------|
| | grating | tuning range | linewidth |
| LIOPSTAR | 1800 l/mm, 60 mm | 355 nm – 900 nm | < 0.1 cm ⁻¹ @ 620 nm |
| LIOPSTAR | 2400 l/mm, 60 mm | 355 nm – 740 nm | < 0.08 cm ⁻¹ @ 570 nm |
| LIOPSTAR-N | 1800 l/mm, 90 mm | 355 nm – 900 nm | < 0.06 cm ⁻¹ @ 620 nm |
| LIOPSTAR-N | 2400 l/mm, 90 mm | 355 nm – 740 nm | < 0.06 cm ⁻¹ @ 570 nm |
| LIOPSTAR-N | 3000 l/mm, 90 mm | 355 nm – 610 nm | < 0.05 cm ⁻¹ @ 560 nm |
| LIOPSTAR-VN | double 1800 l/mm, 90 mm | 355 nm – 900 nm | < 0.05 cm ⁻¹ @ 620 nm |
| LIOPSTAR-VN | double 2400 l/mm, 90 mm | 355 nm – 710 nm | < 0.04 cm ⁻¹ @ 570 nm |
| LIOPSTAR-VN | double 3000 l/mm, 90 mm | 355 nm – 580 nm | < 0.03 cm ⁻¹ @ 570 nm |
| beam specifications | | LIOPSTAR / LIOPSTAR-E | |
| conversion efficiency: Nd:YAG pumped 355 nm | 20% @ 405 nm 14% @ 460 nm | Exalite 404 Coumarin 47 | |
| conversion efficiency: Nd:YAG pumped 532 nm | 25% @ 630 nm 28% @ 565 nm | DCM Rhodamine 6G | |
| wavelength reproducibility | < 0.005 nm | | |
| absolute accuracy | < 0.01 nm | | |
| scan linearity | < 0.002 nm | | |
| wavelength stability | < 0.001 nm/°C | | |
| divergence | 0.5 mrad | | |
| polarisation | > 98 % | vertical | |
| ASE-background | < 0.5 % | | |
| dimensions | | LIOPSTAR / LIOPSTAR-E | |
| LIOPSTAR | 1040 mm x 400 mm x 300 mm ± 10 mm, 80 kg | | |
| LIOPSTAR-E | 750 mm x 400 mm x 300 mm ± 10 mm, 60 kg | | |
| LSEH-Extension | 750 mm x 400 mm x 300 mm ± 10 mm, 30 kg | | |
| beam input height | 180 mm ± 10 mm | | |
| beam output height | 200 mm ± 10 mm | | |
| requirements | | LIOPSTAR / LIOPSTAR-E | |
| pump laser pulse power | 10 mJ ... 1000 mJ (high power option), s-pol | | |
| voltage | 110 V 6A / 220 V 3 A, 50/60 Hz, single phase | | |
| computer | Windows, one free USB port | | |

specification are subject to change without notice

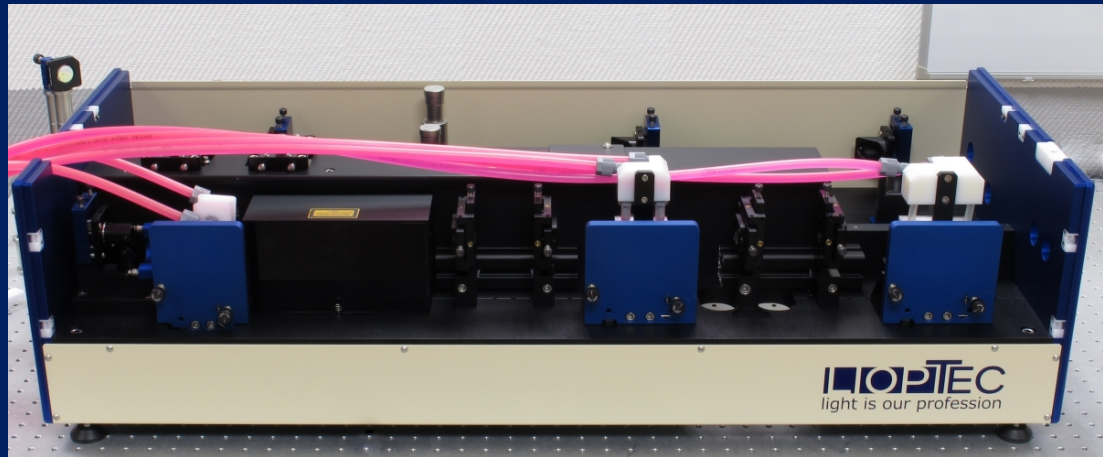
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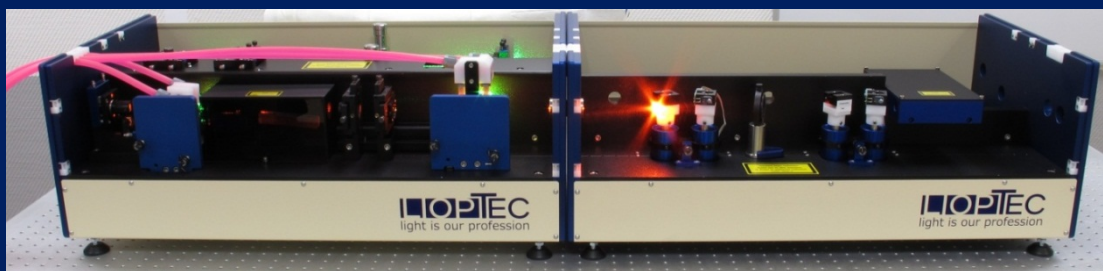
LiopStar



LiopStar with 3 dye cells for high power



LiopStar-E & LSEH



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