The Institute for Emerging Electronic Materials (IET) at IFW Dresden focuses on research into the characterization of photonic band structures, topological edge modes, and other exotic states in topological photonic systems. This includes the manipulation of the Berry phase, selective excitation of topological edge states, chiral edge modes involving gain media, and mode localization related to Moré superlattices. To investigate the photonic band structure, we are planning to construct a momentum-space measurement system utilizing supercontinuum light lasers for sample excitation. Given the varying excitation requirements across different systems, a supercontinuum light source with tunable wavelength and bandwidth is essential for this setup. All specified criteria must be met in full.

Specifications:

Supercontinuum laser

Spectral coverage from 390-2400 nm at any repetition rate

Flat spectrum with 0.6-2.3 mW/nm spectral power density between 400 and 2000 nm (excl. 1064 nm residual pump)

Total power ~2.2 W, out of which ~0.6 W are within the extended VIS < 850 nm (high VIS conversion efficiency)

Power adjustable from 0-100% without changing the repetition rate

VIS power stability better than +/- 0.5 %

BNC PowerLock Interface for actively stabilizing the laser power onto an external feedback signal, 200 Hz sampling rate (typical long-term stability at individual wavelengths ~0.1-0.2 %)

TEM00 mode with $M^2 < 1.1$ at any wavelength in the 400-2400 nm range

Beam pointing stability: < 50 µrad (also during power changes)

Beam pointing accuracy: < 1mrad

Beam divergence ~1 mrad full angle at any wavelength, 1mm spot size at 530 nm, 2mm spot size at 1100 nm

Laser output: achromatic collimator based on multi lens system (not just a single aspheric lens)

Main repetition rate 78 MHz, modelocked fiber oscillator with few ps timing jitter

Optionally: Integrated Pulse Picker with NIM trigger output (with electronically adjustable delay and < 20 ps jitter) that allows adjusting the repetition rate between 0.15 – 78 MHz (on-the-fly rep rate changes with laser power on), pulse suppression > 1:10^4

“Cold” start-up time: <10 seconds

Active feedback loop to compensate for aging of components such as pump diodes, gain fiber and nonlinear fiber

Quality, reliability, maintenance-free operation: all critical components such as the seed laser, nonlinear fiber etc. produced by ISO9001 certified supplier, design for >10.000 maintenance-free operating hours

Approximately 5.000 comparable high-power systems in the market

Remote Diagnostics via USB / Ethernet

One single software with GUI to control the laser and the tunable filters, including power and rep rate / NIM delay adjustments, wavelength/transmission selection and programmable wavelength sweeps. Parallel (simultaneous) operation of the laser from front panel and computer

Software Development Kit including support for LabView, C++, C# and additional programming languages for fully automated control of laser and accessories

Plug-and-play accessories. The light source can be combined with either one of the tunable filters (including the LLTF exclusively available from NKT Photonics) and delivery fibers. Fibers are plug-and-play switchable.

Variable bandpass filter

400-840 nm tuning range

Variable linewidth: 10-100 nm (7-440 nm are possible with limitations on transmission efficiency)

40 dB out-of-band suppression towards shorter wavelengths and 50 dB out-of-band suppression towards longer wavelengths in the 400-900 nm range

<0.2 nm wavelength reproducibility

5. Wavelength temperature sensitivity <0.05 nm / °C

Transmission temperature sensitivity <0.2 % / °C

Unpolarized output

~80% transmission efficiency

IR passthrough for wavelengths >850 nm

Mechanical shutter at each output

Included in laser safety circuit (permanent monitoring of laser input and lid position, with laser emergency shutdown within 10 ms – laser emission only possible when components are installed correctly)

Delivery Fibers

Based on endlessly-single-mode photonic crystal fiber (optionally polarization-maintaining versions with embedded stress rods)

$M^2 < 1.1$ at any wavelength, no single-mode cut-off

2.5 m length

Input and output: achromatic collimator based on multi lens system (not just a single aspheric lens)

Single-mode coupling efficiency of FD7: >70% from 450-950 nm, >60% from 400-1100 nm without readjusting the alignment

- Warranty: 24 months after delivery.

**Regulations of the assignment procedure/Contact person:**

Mrs. Kristin Schwencke via eVergabe

**Terms of delivery:**

Only brand-new, original products of the manufacturer are to be supplied, which are approved in the EU and comply with local safety standards. The deliverability of the offered equipment must be fully secured from the beginning of the contract. Delivery must be feasible by the end of 02/2025.

Delivery place:

IFW Dresden e. V.

Helmholtzstr. 20

01069 Dresden

Germany

**Delivery date: Until February 2025**

Specification: …….....actual delivery date.

Disposal:

Environmentally-friendly packaging and recyclable goods are assumed. The free return of packaging and old equipment from internal production for environmentally friendly disposal by a specialist company must be carried out by the supplier within three working days after information by the customer. The contractor shall provide evidence of environmentally-friendly disposal in accordance with the statutory requirements as requested by the client.

**Prices and terms of payment:**

Advance payments (payment before acceptance) are only possible if they are customary in the industry. For this purpose, the following shall apply as payment modality:

o max. 30% of the order value after receipt of the order confirmation and invoicing (in accordance with Section 56 Federal Budget Code and Section 56 Saxon Financial Code in connection with Section 17 (1)(2) VOL/B) – 14 days with deduction of cash discount or within 30 days net without deduction

o final payment of the order value after successful acceptance and after presentation of a verifiable invoice in accordance with the agreed term of payment

o advance payments shall only be made after presentation of a valid bank guarantee issued to IFW Dresden for an unlimited period free of charge and recognised by IFW Dresden as such, which is provided by a credit institution authorised in the European Union and accepted by IFW Dresden

The prices used are fixed prices and refer to the designs offered for the respective items, including delivery and packaging free place of performance and any customs duties.

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(Place, date ) Name, stamp, legally binding signature)