TUNABLE LIGHTSOURCE WITH CASCADING PHASE-SHIFTING FILTERING

Reference No. 68023

CHALLENGE

Tunable lasers or wavelength swept light sources are used in a wide range of applications like profilometry, laser spectroscopy, optical sensors for measuring pressure and temperature and optical coherence tomography (OCT). In many applications, a very rapid tuning i.e. shifting from one wavelength to another is desired. A powerful concept enabling ultra-high tuning rates is e.g. Fourier Domain Locking (FDML).

INNOVATION

The cascading phase-shifting filtering overcomes several restrictions shown by FDML. Unlike the FDML, the invention does not use a kilometre long glass fibre, so dispersion and damping for higher frequencies which are observed in the glass fibres are no issue. The invention thus enables the production of tunable light sources down to 600nm, whereas tunable FDML lasers are limited above ~1000nm.
The special setup of the light source also allows for the use of non-periodic waveforms and decreases the time to tune to a new frequency significantly. Speeds up to 340 000 wavelength sweeps per second over ~100nm at 0.1nm linewidth have been reached with the available prototype.

COMMERCIAL OPPORTUNITIES

- Spectroscopy
- Sensors
- MHz-OCT

DEVELOPMENT STATUS

Prototype running

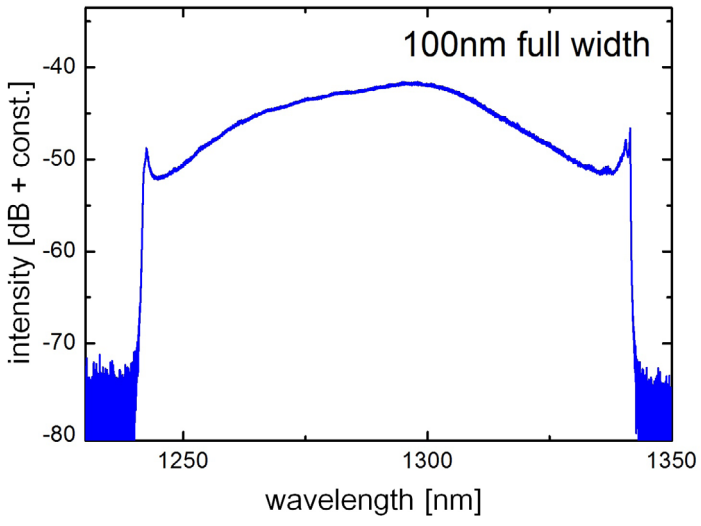

Figure: Example of a new light source taylored for MHz-OCT. Spectral range can be scanned with 340kHz.

REFERENCES:
(1) C. M. Eigenwillig, B. R. Biedermann, W. Wieser, and R. Huber, "Wavelength swept amplified spontaneous emission source", Optics Express 17, 18794-18807 (2009),

#trustedtechnologylicensing

BAYERISCHE PATENTALLIANZ

IP rights:
filed in 2009
DE, FR, GB, US
(granted)

Contact:
Dr. Roland Schanz
+49 (0) 89 5480177-17
rschanz@baypat.de

Bayerische Patentallianz GmbH
Destouchesstr. 68
80796 München

www.baypat.de