



- > Prototyping and pre-series activities
 - + fibre lasers
 - + passive components, optical sensors
 - + optical amplifiers based on rare earth-doped optical fibres
- > Optical metrology
- > Training courses



MULTITEL, your R&D Partner

- > Applied Photonics / Networking / Speech & Signal Processing / Image Processing
- > Development and implementation of innovative technology solutions
- > Transfer to industries
- > Strong participation in E.U. programmes



“ Multitel’s Applied Photonics department works on the design and development of optical fibre based innovative solutions, realization of prototypes and pre-series devices, answering the specific needs of customers and industrial partners. ”

PROTOTYPING AND PRE-SERIES ACTIVITIES

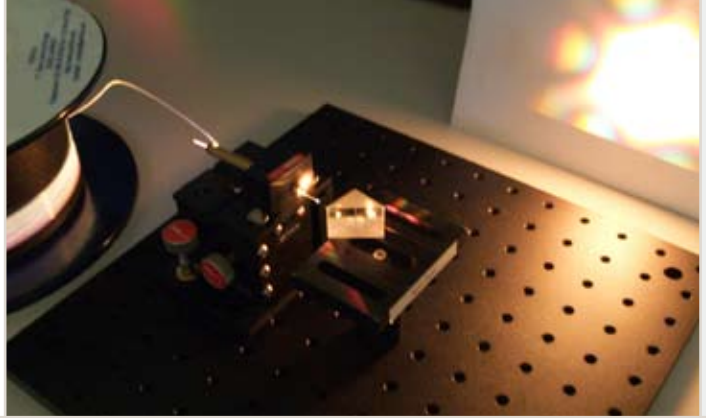
Based on its experience in optical amplification, lasers and fibre components, Multitel develops and delivers all-fibre based solutions and prototypes for the design of innovative optical products for telecommunication, medical applications, manufacturing, sensing, defence and aerospace, amongst others.

1. FIBRE LASERS



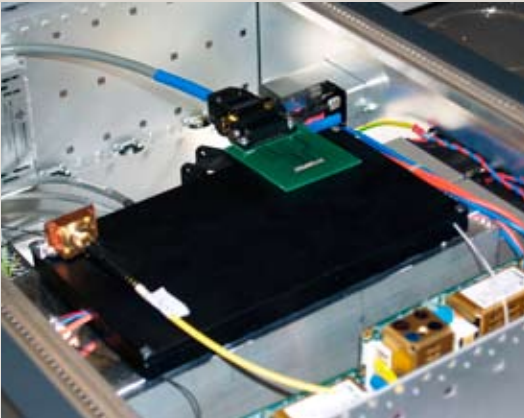
Multitel has a strong activity in the design and prototyping of innovative fibre laser sources. These lasers are a very competitive alternative compared to more traditional types of lasers: higher design flexibility, lower maintenance operations, higher power efficiency (25% against typically 3% for a Nd:YAG laser), mechanical stability, compactness, superior optical performances (high spatial beam quality, high repetition rates, narrow spectral linewidth), ease-to-use (stable laser, flexible cable, etc.), reliability (higher than 30 000 hours), eye-safe (depending on wavelength) and lower cost.

Multitel develops lasers with a wide range of specifications according to the customers’ needs. These lasers can be either based on Q-switching, mode-locking, MOPA, Fabry-Perot or ring cavities configuration. Consequently, the performance can be completely fitted to the application’s needs providing lasers with either narrow linewidth or broadband emission, CW or pulsed (femtosecond to nanosecond regimes are possible) at various wavelengths (from 1 μ m to 2 μ m and in the visible or UV by external frequency conversion).



Applications in :

- ➔ High-power fibre lasers for medical applications (surgery, dermatology, etc.);
- ➔ Pulsed lasers for white light super-continuum sources (cytology, tomography, etc.); *
- ➔ High-energy single-longitudinal-mode fibre lasers (LIDAR, spectroscopy, etc.);
- ➔ High-power ultra-short pulse lasers (imagery, surgery, micromachining, etc.).



* In this context, Multitel is also involved in the integrated project NextGenPCF, submitted in the IST activity area of the FP6.

For more information on NextGenPCF : <http://www.nextgen-pcf.eu/>

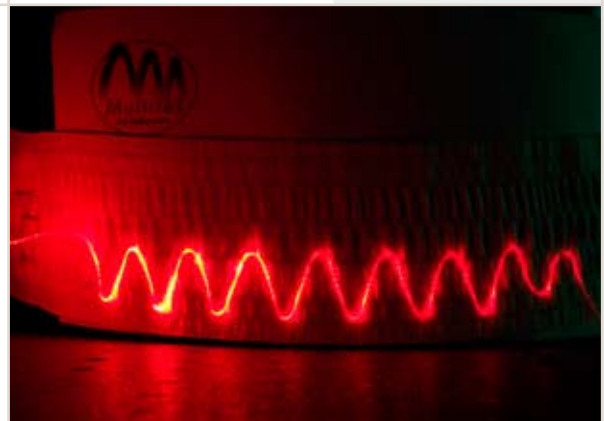
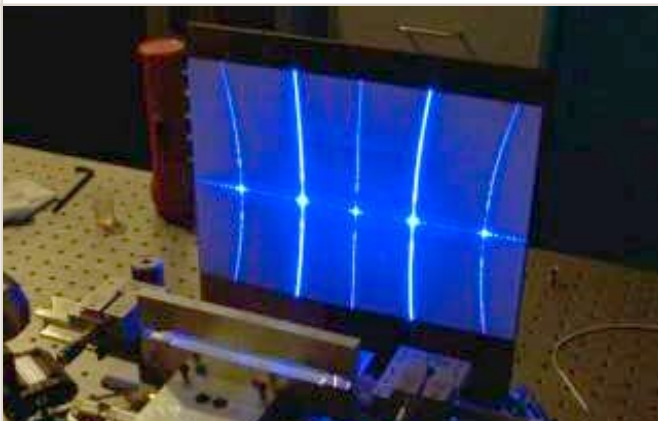
2. PASSIVE COMPONENTS, OPTICAL SENSORS

The continuous monitoring of physical and chemical parameters in harsh environments, or physiological parameters in the medical field, is essential. Optical sensors can perform these multiple functions in a large range of applications to improve the quality and speed of industrial processes, for quality control, medical diagnosis or for preventing and monitoring possible anomalies.

Multitel develops customized solutions for chemical, physical or biological sensing. Optical sensors are based on several techniques, such as Fibre Bragg Grating (FBG) and Long Period Grating (LPG), Brillouin distributed fibre sensors, time domain reflectometry (OTDR) or integrated optics (lab on chip) technology. Multitel know-how goes from the numerical modelling to the design and prototyping of the sensors, the optical interrogation system and the system for data acquisition and analysis.

Realizations :

- Optical fibre sensors for health structural monitoring (in composite materials);
- Optical biosensors for the detection of chemical species or biological molecules (proteomics);
- Integration of optical sensors in fabrics (for medical applications).



In this field, Multitel is involved in three other European projects in the IST priority of the FP6, namely PHODYE, SABIO and OFSETH, which is led by Multitel.

OFSETH : <http://www.ofseth.org>

SABIO : <http://www.ist-sabio.org>

PHODYE : <http://www.phodye.icmse.csic.es>

3. OPTICAL AMPLIFIERS BASED ON RARE EARTH-DOPED OPTICAL FIBRES

Multitel benefits from a large expertise developed in the fields of modelling, design and testing of optical amplifiers: erbium-doped fibre amplifiers (EDFAs) and ytterbium-doped amplifiers. Multitel's engineers work on the upgrading of the performances of such amplifiers, mainly in terms of size reduction, energy consumption, higher output power and advanced dynamic functionalities (noise reduction, dynamic gain, and flat spectral response).



Realizations :

- Noise factor record (< 5.2 dB) for a C-band EDFA with dynamic gain control and 1dB gain flatness on the whole Telcordia temperature range;
- Power record (20 dBm) for a WDM L-band EDFA, OEM compact packaging (MSA).

OPTICAL METROLOGY SERVICES

Multitel provides optical metrology (LAN, MAN, WAN, single mode and multimode fibres) and optical calibration (according to the international standards) services. The centre has the necessary equipment to perform high quality measurements as an independent expert:

- ↳ Optical Time Domain Reflectometry (OTDR) at 850, 1300, 1310, 1550 and 1625nm;
- ↳ Chromatic dispersion and polarization mode dispersion characterization;
- ↳ Spectral attenuation on CWDM spectrum.

Multitel's lab performs recalibration of the following optical equipments according to international standards:

- ↳ Optical Time Domain Reflectometers
- ↳ PMD Gauges
- ↳ Chromatic Dispersion Gauges
- ↳ Optical Spectrum Analysers
- ↳ Optical Powermeters
- ↳ Optical Sources
- ↳ Optical Attenuators
- ↳ Wavelength meters



Advantages:

Complete characterization of your passive optical fibre network

Short delay: maximum 5 days in our lab

Low cost

Detailed report delivered together with the measurement

TRAINING COURSES

Multitel offers a wide range of training courses, adapted to your level of knowledge:

- ↳ Introduction to Optical Fibre Based Transmission
- ↳ Introduction to Laser Safety
- ↳ Optical Connections and Fibre Splicing
- ↳ Practical Approach on OTDR Technology
- ↳ Optical Impairments on Optical Fibre Links
- ↳ WDM Technology (basics and advanced)
- ↳ Optical Amplification
- ↳ FTTH Access Technology
- ↳ HFC Networks (Hybrid Fibre Coax)

We also offer training courses in the area of photonics on specific customer requirement.



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