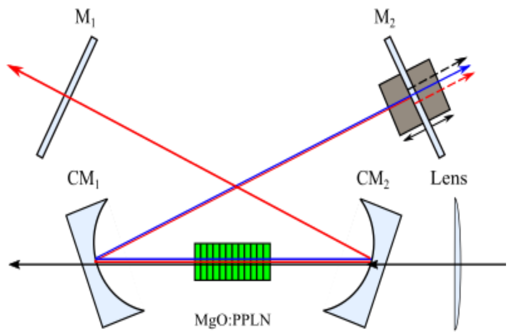
Open postdoctoral position

Design, realization and characterization of gigahertz optical parametric oscillators.



Systems providing femtosecond of picosecond pulses at gigahertz repetition rate have been identified as a key technology for telecom in the 1.5 µm spectral range. Thus several techniques have been proposed to produce such laser sources such as mode-locked Er, Yb: glass lasers[1], rational harmonic mode locked Er-fiber lasers[2] and synchronously pumped optical parametric oscillators[3] (SPOPO).

Compared to laser, SPOPOs have many interesting features. They provide at very high repletion rate (up to 80 GHz), short and widely tunable signal pulses. Such a device can address many important applications ranging from low noise frequency combs[4], optical interconnect[5], lidar[6], high-speed asynchronous sampling[7] and analog to digital converters[8]. Few years ago by Jiang et al.[9] proposed to develop GHz OPO pumped by pulses delivered at MHz repetition rate. This technique is based on the cavity difference between the OPO and the pump laser. In general, synchronous pumping is achieved when the cavity length of the OPO (L_{OPO}) and the pump laser (L_{pump}) satisfies the following equation: $M\,L_{OPO} = N\,L_{pump}$ where N and M are positive integers. For $M>N$, the OPO cavity length is shorter than the pump laser. This method has been applied to generate high repetition rates with $M>N$[10] and $M<N$[6].

In the frame of this project we firstly aim at modifying the 108 MHz, MgO:PPLN OPO we build in our lab to run it at 1 GHz and 3 GHz. In a second step, we plan to run this OPO at 10 GHz and 30 GHz pumping it with a fiber laser delivering picosecond pulses at 1 GHz. In a third step, these devices will be used to perform time resolved spectroscopy in the 1.3-1.8 µm and 2.5-3.9 µm spectral range.

Job description: In the frame of this project, we are looking for a postdoctoral candidate that will:

- Design, realize GHz OPOs and characterize the pulses delivered by this device pumped by ytterbium fiber laser. To run this device an embedded system is required to run properly this device.
- Develop simulations that will model and account for the different working conditions of our GHz OPOs.

Requirements: We are looking for a versatile and independent person with a solid background in designing and running of femtosecond and picosecond optical parametric oscillators. Capacities to elaborate codes of simulation and to conceive an embedded system for laser devices will be greatly appreciated. Abilities to supervise M. Sc. and PhD students, to run and analyze experimental work will be of additional benefits.

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Information and salary: The Laboratoire Ondes et Matières d'Aquitaine has extensive research activities on diverse areas such as laser physics, time resolved spectroscopy, materials and photonics, condensed matter physics, soft matter and biophysics. It belongs to the University of Bordeaux which is a worldwide recognized research institution.

The position will be filled for a period of 12 months renewable one year. The expected start date is June 2019 or as mutually agreed upon by both parties. A trial period of one month will apply. The typical gross salary of a postdoctoral researcher is in between 30000 €/year and 34000 €/year, depending on the researcher's experience.

How to apply: Applications should include the following documents:

- Curriculum Vitae.
- List of publications.
- References.
- Motivation letter (incl. research directions):
  - 1-3 pages where you introduce yourself and present your qualifications.
  - Previous research fields and the main research results.
  - Future goals and research focus.

For more information, please contact: Dr. Eric FREYSZ, eric.freysz@u-bordeaux.fr

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