

BENEFICIARY OF MEDEA

**AMPLITUDE TECHNOLOGIES**

**LISSES**

**FRANCE**



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### Useful Links

[www.medeo-horizon2020.eu](http://www.medeo-horizon2020.eu)



Molecular Electron Dynamics investigated by Intense Fields and Attosecond Pulses



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## Company Introduction

Amplitude Technologies is one of the three laser facility manufacturers in Amplitude laser group. Since the establishment of Amplitude Technologies in April 2001, all efforts have been concentrated on the development of advanced modules and techniques dedicated to these High Power femtosecond amplifiers. Nowadays, Amplitude Technologies is the global expert in science, design and manufacture of high performance laser systems for a variety of specialist applications. In addition to systems used for fundamental physics research, the company is a leading authority in the medical research domain including radiography and cancer treatment projects.

As an important part of its strategy of development, Amplitude Technologies has established formal collaborations with research groups, known worldwide for their expertise in femtosecond Lasers technology, such as CEA-Saclay (DRECAM), CELIA (Bordeaux, France), LOA-ENSTA (Palaiseau, France), Max Born Institute (Berlin, Germany), Politecnico di Milano (Milan, Italy) etc. A common lab situated at CEA-Saclay was created for the development of new instruments and new technologies. During the last years, Amplitude Technologies has been involved into many Industrial-Academic partnerships, which led to major achievements in terms of commercial products for Amplitude Technologies.

Managing the academic collaborations is one of the major missions of R&D femtosecond group. So far we have 4 permanent members and 4 PhD students, listed as below:

**Group leader:** Emilien Gontier

**Group members:** Xiaowei Chen, Benoit Bussiere, Mathieu Paurisse, Hermance Jacqmin

Joinel Cheleux, Samuel Marrazzo, Anna Gollinelli, Michele Natile

## Offered training

### Research Training Modules (RTMs)

- A. Regenerative (Regen) amplifier (see following sections for details)
- B. Alignment of grating compressor (see following sections for details)

## A. Regenerative amplifier

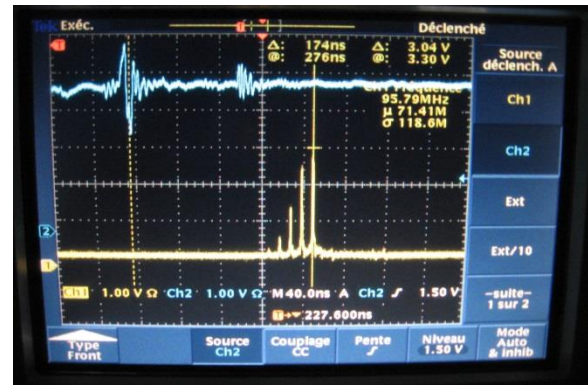
### Objective

The goal of the RTM is to align a Ti:sa Regen amplifier from scratch and to understand its work principle. Regen amplifier is one of classic and critical parts in the Amplitude Technologies laser systems. It will be beneficial for maintaining the laser system in good shape.

### Equipment

The ESRs will be provided with all optical and electronical components for the Regen cavity, including:

Optical mounts	Broadband mirrors	Pockels cells	Photodiodes
Alignment irises	Oscilloscope	Trigger signal generator	Oscillator
Beam attenuators	Ti:sa crystal	Visible spectrometer	Personal protection devices
Power meter	BNC cables		



### Implementation

The training will have a series of intermediate milestones and objectives:

- Introduction to the basic work principle of regenerative amplifier
- Alignment of a simple cavity without Pockels cells
- Orientation of the Ti:sa crystal
- Alignment of Pockels cells
- Trigger delay settings
- Buildup time optimization
- Injection
- Characterization of the Regen cavity

### Duration

For the complete experiments, a period of one week is planned. During this time the ESR will be involved mostly in the practicing of the cavity alignment.

The period for the participation to the RTMs should be agreed upon with the tutors

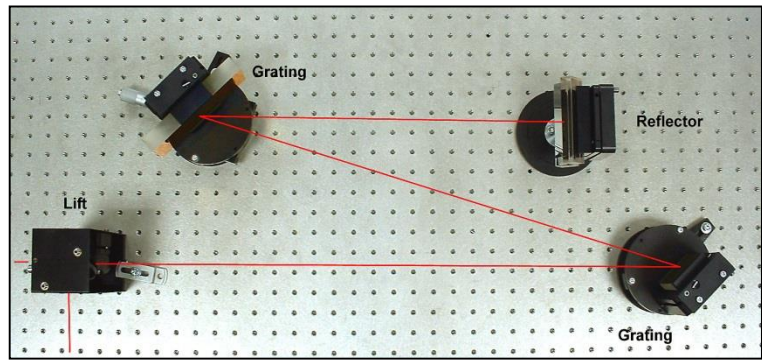
### RTM at a glance

Title	Host institution	Objective	Duration/ Period	Tutors
Regenerative amplifier	<b>AMPLITUDE</b>	Alignment of Regenerative amplifier <i>experimental activity</i>	1 week	<b>Mathieu Paurisse</b> mpaurisse@amplitude-technologies.com <b>Xiaowei Chen</b> xchen@amplitude-technologies.com <b>Emilien Gontier</b> egontier@amplitude-technologies.com

## B. Alignment of a grating compressor

### Objective

The goal of the RTM is to align a grating compressor of a Ti:sapphire laser system. Pulse duration measurement by WIZZLER is involved in this activity. The pulse duration optimization is essential for the following application of the whole laser system.



### Equipment

The ESRs will be provided with all optical components for the alignment of the compressor.

Optical mounts	Broadband mirrors	Gratings
Alignment irises	Wedges	WIZZLER+PC
Beam attenuators	Spectrometer	CCD camera
Power meter		

### Implementation

The training will have a series of intermediate milestones and objectives:

- Introduction to the compression principle
- Alignment of the gratings
- Test of the spatial chirp
- Rough pulse compression through white light generation
- Measurement of the pulse duration by WIZZLER
- Optimization of the third-order phase

### Duration

For the complete experiments, a period of three days is planned. During this time the ESR will be involved mostly in the alignment of the compressor and the preparation of the measurement experimental setup.

### RTM at a glance

Title	Host institution	Objective	Duration/ Period	Tutors
Alignment of a grating compressor	<b>AMPLITUDE</b>	Alignment of a grating compressor and pulse duration optimization <i>experimental activity</i>	3 days /to be discussed	<b>Mathieu Paurisse</b> mpaurisse@amplitude-technologies.com <b>Xiaowei Chen</b> xchen@amplitude-technologies.com



## About the life in Amplitude

Amplitude Technologies is situated in Lisses, a small city in the south suburbs of Paris. It is easy to go to Paris by bus and RER D. You could choose living in Evry which is on the line of RER D (station: Evry-Courcouronnes). It is 10 minutes away from Amplitude by bus (Line 415 and Line 416), Living in Paris is a more attractive choice for young people, and the transportation time is within 1 hour between Paris and the company.

You could find touristic information on the following links:

[www.paris.fr](http://www.paris.fr)

[www.ville-lisses.fr](http://www.ville-lisses.fr)

And time tables for bus between Amplitude and Evry-Courcouronnes:

[www.bus-tice.com/se-deplacer/fiches-horaires-des-lignes](http://www.bus-tice.com/se-deplacer/fiches-horaires-des-lignes)