Single-shot dispersion-scan device for the characterization of ultrashort laser pulses

Fact Sheet

Project Information

SISCAN

Grant agreement ID: 789992

DOI
10.3030/789992

Project closed

EC signature date
12 February 2018

Start date
1 April 2018

End date
30 September 2019

Funded under
EXCELLENT SCIENCE - European Research Council (ERC)

Total cost
€ 150 000,00

EU contribution
€ 150 000,00

Coordinated by
LUNDS UNIVERSITET
Sweden

Objective

The idea to be taken to proof of concept is a novel real-time characterization device for short laser pulses, based upon SIngle-Shot dispersion SCAN (SISCAN). The use of femtosecond laser pulses with duration from the single-cycle to the multi-cycle regime, in various applications in research, industry or medicine demands a precise characterization and control of each laser pulse. We propose a device for measuring the intensity and the phase of laser pulses, based upon dispersion scans, i.e. scans of the second harmonic spectrum as a function of dispersion of the fundamental field. The device is able to characterize individual laser pulses and therefore will provide useful realtime feedback to adjustments of any laser system.

Recently, in the effort to improve the control of light pulses required for our ERC-supported research, two variants of a single-shot d-scan, i.e. one for few-cycle pulses (3-10 fs) and one for longer pulses (15-100 fs) were developed. At the same time, we introduced a new algorithm, drastically reducing the retrieval time. The combination of these developments will allow for measuring individual pulse properties in real-time for very diverse types of lasers. At the time this application is being sent, two patent applications have been submitted.

Through technical verification (Lund University, Sweden) and business activities (a small company located in Portugal, Sphere Ultrafast Photonics, already commercializing the original, multiple shot version of the device), we will demonstrate the functionality of the concept, the risks will be assessed and minimized and we will prepare to exploit the increased commercial potential, addressing laser manufacturers as well as laser users in both the scientific and commercial spheres.

Fields of science (EuroSciVoc)

natural sciences > physical sciences > optics > **laser physics**

Programme(s)

H2020-EU.1.1. - EXCELLENT SCIENCE - European Research Council (ERC) MAIN PROGRAMME

Topic(s)

ERC-2017-PoC - ERC-Proof of Concept

Call for proposal

ERC-2017-PoC

See other projects for this call

Funding Scheme

[ERC-POC - Proof of Concept Grant](#)

Host institution

LUNDS UNIVERSITET

Net EU contribution

€ 63 812,00

Total cost

€ 63 812,00

Address

Paradisgatan 5c
22100 Lund
Sweden

Region

Södra Sverige > Sydsverige > Skåne län

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Beneficiaries (2)

LUNDS UNIVERSITET

Sweden

Net EU contribution

€ 63 812,00

Address

Paradisgatan 5c
22100 Lund

Region

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Total cost

€ 63 812,00

SPHERE ULTRAFAST PHOTONICS SA

Portugal

Net EU contribution

€ 86 188,00

Address

RUA DO CAMPO ALEGRE 1021 EDIFICIO FC6
4169 007 Porto

SME

Yes

Region

Continente > Norte > Área Metropolitana do Porto

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Total cost

€ 86 188,00

Last update: 15 August 2022

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