HORIZON 2020

Multiscale optical frequency combs: advanced technologies and applications

Results

Project Information

MOCCA

Grant agreement ID: 814147

Project website

DOI
10.3030/814147

Project closed

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22 November 2018

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1 February 2019

End date
31 January 2023

Funded under
EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions

Total cost
€ 1 092 262,68

EU contribution
€ 1 092 262,68

Coordinated by
ASTON UNIVERSITY
United Kingdom

CORDIS provides links to public deliverables and publications of HORIZON projects.

Links to deliverables and publications from FP7 projects, as well as links to some specific result types such as dataset and software, are dynamically retrieved from OpenAIRE.

Deliverables

Documents, reports (16)

Insight into application of dual OFC spectrometers for gas sensing and metrology

Design concepts of dual OFC spectrometers for gas sensing and metrology will be provided results on the optimisation of the OFC spectrometers parameters to match applications areas will be delivered

Theoretical models of nonlinear dynamics of passive and active comb generators based on SEP, PCM and SNAP technologies: numerical codes.

Models and software will be developed and tested to obtain dynamic specifications of passive and active comb generators based on SEP PCM and SNAP technologies

Career Development Plans

4 ESRs trained to the advanced PhD level

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Classification of comb states and phase diagram: Report M36

Theoretical results on classification of comb states for the OFCs design optimisation will be provided

Mathematical models of SEP-based OFC generators: numerical codes. Report M20

Models and software will be developed and tested to obtain specifications of SEP-based OFC generators

Mathematical models of dual OFC spectrometers numerical codes. Report M40

Theoretical models of dual OFC spectrometers based on SNAP SEP and PCM platforms will be provided

Characterisation of SEP-based OFC generators

Fabrication technology will be specified results of the experimental characterisation will be provided

Experimental and theoretical techniques for tailoring and optimisation of (silicon-based) OFC generators specifications

Outline of the fabrication technology for resonant Si Si3N4 based photonic devices in the context of OFC applications will be provided

Inter-comparison of nonlinear dynamics models and experiments

Theoretical and experimental results on nonlinear dynamics will be analysed for the optimisation of specifications of passive and active SNAP silicon and photonic crystal microcavitybased OFC generators

Samples of dual OFC spectrometers

Results of the experimental characterisation of dual OFC spectrometers will be provided

Samples of SNAP, silicon and photonic crystal microcavity-based OFC generators W

Fabrication technology will be specified results of the experimental characterisation will be provided

Minimization procedures and tests

Results of application of multimodal models for optimisation of OFCs in the context of specific phase relation among spectral components will be provided

Dissemination and Outreach portfolio

Dissemination and Outreach portfolio: papers, conference presentations, patents, software copyrights,e-portfolio,posters,recorded school lectures,optical demonstrations.

Experimental and theoretical techniques for tailoring and optimisation of (SNAP- and photonic crystal microcavity-based) OFC generators specifications

Results of the experimental and theoretical techniques for tailoring and optimisation of SNAP silicon and photonic crystal microcavitybased OFC generators will be delivered

Design concepts for OFC generators

Design concepts for siliconbased OFC generators

Websites, patent fillings, videos etc. (1)

MOCCA website

Open Research Data Pilot (1)

Data Managment Plan

Consortium should include any relevant information, results, activities who could contribute to any policy development in their domain. This information could then be used for policy feedback purposes (if project is considered policy relevant).

Other (1)

4 recruited ESRs

Publications

Peer reviewed articles (6)

Photonic crystal optical parametric oscillator
Author(s): Gabriel Marty, Sylvain Combrié, Fabrice Raineri, Alfredo De Rossi
Published in: Nature Photonics, Issue 15/1, 2021, Page(s) 53-58, ISSN 1749-4885
Publisher: Nature Pub. Group
DOI: 10.1038/s41566-020-00737-z

Vector harmonic mode-locking by acoustic resonance
Author(s): Sergey Sergeyev; Stanislav Kolpakov; Yury Loika
Published in: Photonics research, Issue 1, 2021, ISSN 2327-9125
Publisher: Optica Publishing Group and Chinese Laser Press
DOI: 10.1364/prj.424759

Polarization attractors driven by vector soliton rain
Author(s): Sergey V. Sergeyev; Mahmoud Eliwa; Hani Kbashi
Published in: Optics Express, Issue 3, 2022, ISSN 1094-4087
Publisher: Optical Society of America
DOI: 10.1364/oe.462491

Angstrom-precise fabrication of surface nanoscale axial photonics (SNAP) microresonators with a flame
Author(s): Misha Sumetsky, Victor Vassiliev
Published in: Laser Physics Letter, 2022, ISSN 1612-2011
Publisher: Wiley - VCH Verlag GmbH & CO. KGaA
DOI: 10.1088/1612-202x/ac61d4

Continuous-Wave Second-Harmonic Generation in Orientation-Patterned Gallium Phosphide Waveguides at Telecom Wavelengths
Author(s): Konstantinos Pantzas, Sylvain Combrié, Myriam Bailly, Raphaël Mandouze, Francesco Rinaldi Talenti, Abdelmounaim Harouri, Bruno Gérard, Grégoire Beaudoin, Luc Le Gratiet, Gilles Patriarche, Alfredo de Rossi, Yoan Léger, Isabelle Sagnes, Arnaud Grisard
Published in: ACS Photonics, Issue 2022, 9, 6, 2032–2039, 2022, ISSN 2330-4022

Publisher: American Chemical Society
DOI: 10.1021/acsphotonics.2c00156

Fast dispersion tailoring of multimode photonic crystal resonators
Author(s): Francesco Rinaldo Talenti; Stefan Wabnitz; Inès Ghorbel; Sylvain Combrié; Luca Aimone-Giggio; Alfredo De Rossi
Published in: Physical Review A, Issue 4, 2022, ISSN 1050-2947
Publisher: American Physical Society
DOI: 10.48550/arxiv.2210.12017

Conference proceedings (1)

Frequency comb generation in silicon nitride ring resonators with amplitude modulated pump
Author(s): J. M. Chavez-Boggio, Daniel Bodenmüller, Adnan Baig, Syed Ahmed, Tobias Hansson, Francesco Rinaldo Talenti, Stefan Wabnitz, Daniele Modotto
Published in: Laser Resonators, Microresonators, and Beam Control XXIII, 2021, Page(s) 3, ISBN 9781510641808
Publisher: SPIE
DOI: 10.1117/12.2576706

Other Research Products

Other Research Products via OpenAire (1)

Reconfigurable microresonators induced in side-coupled optical fibers
Author(s): Vassiliev, V.; Sumetsky, M.
Published in: arXiv

Last update: 17 July 2023

Permalink: https://cordis.europa.eu/project/id/814147/results