



Annual Progress Conference

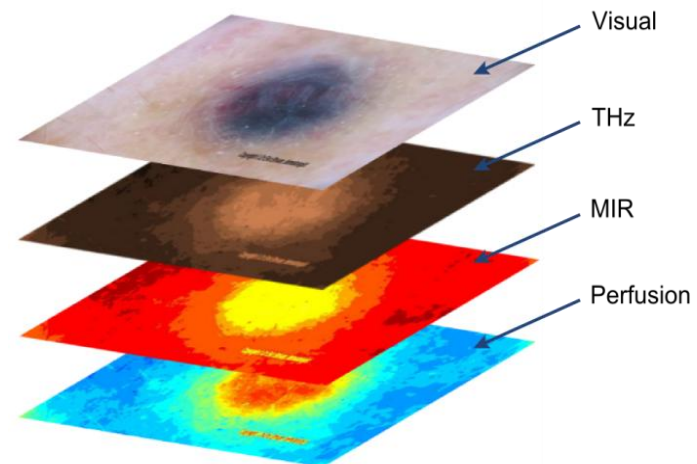
BM1205 Action **Skin Cancer Detection using Laser** **Imaging**

Dragan Indjin
University of Leeds, UK

COST Domain - Biomedicine and Molecular Biosciences (BMBS)

Scientific scope)

- Provide an interdisciplinary framework to enhance interaction activities within the field of optical biosensing, between world-class academic groups, clinicians, and system integrators from industry.
- ***The main objective of this Action is to coordinate efforts and enhance interaction of researchers, as well as to promote development and application of early, accurate diagnosis of skin cancer known to be the key determinant of patient outcome.***
- Network scientific **objectives** are:
 - Development of VCSEL Array full-field ***blood perfusion imaging***
 - ***Tissue characterization in mid-infrared*** (MIR) in reflectance mode
 - ***Tissue characterization at terahertz*** (THz) frequencies
 - ***Validation and evaluation*** of combined sensing modalities





Scientific scope

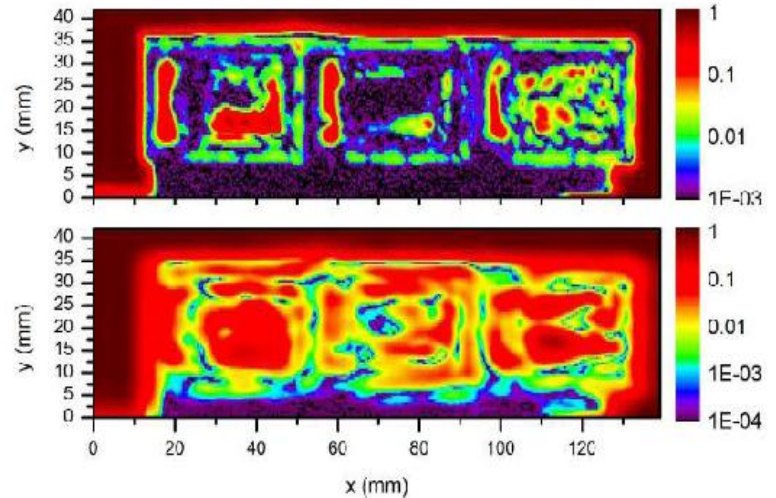
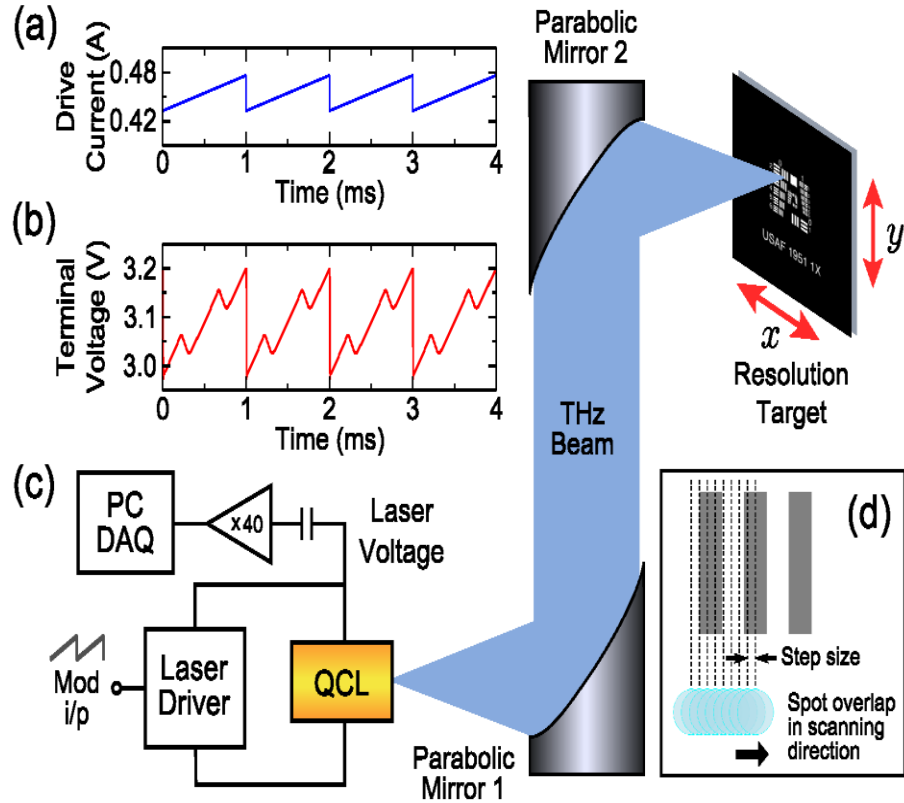
•Objectives

- Provide an interdisciplinary framework to enhance interaction activities within the field of optical biosensing, between world-class academic groups, labs and system integrators from industry
- Develop and exploit novel laser sources and innovative imaging platforms such as optical feedback interferometry in specific biomedical applications.
- Exchange knowledge, explore and compare technology platforms and perform clinical validation and evaluation of new devices which will permit detection of both the changes in skin lesions and disordered blood flow patterns and tissue perfusion typical of malignancy

Scientific outputs related to networking in the first year

- **Methods for swept-frequency characterisation of materials, coherent high-resolution 3D profile imaging and inverse synthetic aperture radar high resolution imaging based on self-mixing effect in THz quantum cascade-laser. (AU-UK)**
- **First ever demonstration of self-mixing imaging with room-temperature continuous wave mid-infrared interband cascade laser . (UK-AU-DE)**
- **THz time domain spectroscopy and imaging of paraffin-embedded cancer sample tissue - STSM (PT-LI)**
- **Elaboration of human tissue measurement method based on Near-Infrared Spectroscopy. Tissue screening, especially skin lesions, validation of the method - STSM (PL-FI)**
- **The use of confocal microscopy in specific clinical cases where additional evaluation of skin tumor is indicated: analysis of recurrent pigmented melanocytic tumors - STSM (AT-CR)**
- **7 high profile journal publications between Action's partners from different countries with several more in prospect, all acknowledging BM1205 COST Action.**

Scientific outputs related to networking in the first year (2)



High-resolution imaging system based on self-mixing effect in THz Quantum cascade laser (QCL); adapted from Action's publication in Optics Letters vol 39, issue 9, pp. 2629-2632 (2014).

Gastric tissue, adenocarcinoma pT3. Visible microphotographs of the histopathologic sections, THz Imaging at 590 GHz and at 201 GHz. Adapted from Action's publication submitted to the Journal of Molecular Structure.



Capacity building related to networking

- **8 STSMs between European partners and one special STSM to international partner in Australia.**
- **Training School for more than 30 young researchers, with 4 Action's MC members delivering lectures as trainers. Proceedings to be published by Institute of Physics Publishing as a special issue of Physics Scripta journal.**
- **2 major Workshops: 1) THz and Mid-infrared Radiation and Applications to Cancer Detection Using Laser Imaging, with published Proceeding (UK) and 2) Hyperspectral Imaging in Medicine (Norway)**

Capacity building related to networking (2)

- **Successful grant application CIP-PSP FP7 Grant CIP-PSP-GA621066 “DIAGNOPTICS: Diagnosis of skin cancer using optics” (Dec 2013-Dec 2016). Budget 4744 K€. UPC (ES), INPT (FR), Hospital Clinic (ES), among others.**
- **Successful project application „Ultrafast Infrared Emitter on a Quantum Cascade – FastIQ“, Swiss National Science Foundation“ (April 2014. – March 2016) SCOPES program, Joint Research Projects, ref. no. IZ73Z0_152761. Budget CHF 177 759. CSEM (CH), ETF (RS)**
- **Successful grant: “The diagnostic capability of X-Ray scattering parameters for the characterization of diseased soft tissue“ , University of Novi Sad (RS)**
- **Horizon 2020 ITN Training Network application: “INTENT - INnovative TErahertz Network Training “, University of Leeds (UK), CNRS and Paris Sud (FR), University of Bari and CNR (IT); Technische Universität München (DE) University of Warsaw, (PL). Submitted on 9 April 2014.**
- **Grant application ARC “Discovery” : Development of a Coherent System for Materials Analysis at Terahertz Frequencies: Quantification of Skin Hydration” University of Queensland (AU) and University of Leeds (UK) ; submitted in March 2014, Total requested budget: AU\$ 875 918.**

Action Web Page

www.skin-laser-imaging.org

Skin Laser Imaging | BMBS COST Action BM1205 - European Network for Skin Cancer Detection using - Windows Internet Explorer

http://skin-laser-imaging.org/

File Edit View Favorites Tools Help

★ Favorites Skin Laser Imaging | BMBS COST Action BM1205 ...

SKIN LASER IMAGING

BMBS COST ACTION BM1205 - EUROPEAN NETWORK FOR SKIN CANCER DETECTION USING LASER IMAGING

cost

ABOUT THE ACTION NEWS ORGANISATION EVENTS **STSM** PUBLICATIONS DOCUMENTS LINKS

ABOUT STSM
CALLS FOR STSM
STSM REPORTS

ABOUT THE ACTION

The Action will provide an interdisciplinary framework to enhance interaction activities within the field of optical biosensing, between world-class academic groups, labs and system integrators from industry. It will exploit novel laser sources and innovative feedback interferometry in specific biomedical applications.

Recent developments in the design of solid-state laser sources at near-infrared, mid-infrared and terahertz frequencies, coupled with novel self-mixing approaches to signal detection and the integration of these into imaging platforms, provide a way forward in the design of the next generation of detection systems.

Specifically, we propose extending the noninvasive interrogation of skin tissue into these frequencies. The Action will exchange knowledge, explore and compare technology platforms and perform clinical validation and evaluation of new devices which will permit detection of both the changes in skin lesions and disordered blood flow patterns and tissue perfusion typical of malignancy.

The COST scheme is an ultimate choice for this network as it will bring together COST countries academia, industry and clinical end-users which would be virtually impossible through any other European funding mechanism.

SEARCH:

SEARCH

LOG IN:

Register
Log in

About the Action
News
Organisation
Members
Project Office
Working Groups

Internet | Protected Mode: On 100%

02:19
Sunday
27/04/2014