Business branches & activities

Electromagnetic & Multiphysics modelling & design software, 3D & BOR 2D tools from QuickWave family

Based on 300+ publications by:
Prof. W. Gwarek, IEEE Fellow, DML, Pioneer Award, Warsaw University of Technology
Dr. M. Celuch, President of QWED

Text fixtures for precise material measurements

Based on 300+ publications by Prof. J. Krupa, IEEE Fellow

Consultancy & design services based on EM & material characterisation and measurements techniques
team of 10-engineers, 4 PhDs, 2 Pros
key areas: MW power appliances, customised resonators for material measurements, antennas, sheets

Public funded research projects

QuickWave

Electromagnetic & Multiphysics modelling software accounting for materials modelling at the continuum level.

Thin sheets of carbon-based polymer composites described with surface resistance in [Ω]

Macrossional modeling of biological problems

Material parameter dependent on process driving force

Continuum modelling

- Electromagnetic
- Thermal
- Heat Flow
- Fluid Flow
- Parameters dependent on process driving force
- interfaces to external modules

Obtaining equivalent parameters for continuum modelling

Effective equivalent parameters

- Artificial structural materials – chiral materials

In-house measurements

Popcorn susceptor

Measurements of Surface resistance

Simulation model

Material measurements

Split-post dielectric resonators for low-loss laminar dielectrics measurements subject of European Standard IEC 61189-2-721:2018 endorsed by Keysight Technologies Option 003 N1500A

Recent SPDR-based designs for larger surfaces of:
- large sheets of glass
- semiconductor wafers

Manual scan @1.9 GHz

Automatic scan @10 GHz

QWED standard SPDRs @ 1, 2.45, 5, 10, 15 GHz

Ref.: www.qwed.eu
M. Celuch et al., IEEE MTT-3 IMS, Boston, 2019.
www.mmama.eu recent work under H2020-NMP-07-2017 grant MMAMA No. 761036

EU funded research projects

FP6 SOCCO – development and validation of an optimal methodology for overlay control in semiconductor industry, for the 32 nm technology node and beyond.

FP6 CHISMACOM – development, modeling, and applications of chiral materials → EM validation of mixing rules

Eureka! 2602 MICRODEFROST MODEL – innovative software-based product development tool for simulating and optimising heating and defrosting processes in frozen foods in microwave ovens

FPT HIRF SE (High Intensity Radiated Field Synthetic Environment) – numerical modelling framework for aeronautic industry

Eureka FOODWASTE – developing new microwave treatment system for high water content waste

ERA-NET MNT NACOPAN – applications and modelling of nano-conductive polymer composites → EM validation of mixing rules

NGAMZ – designing an industrial device for thermal bonding of biluminescent surfaces with the aid of microwave heating

H2020 MMAMA (Microwave Microscopy for Advanced and Efficient Materials Analysis and Production) – accelerating the development of high efficiency solar cells through application and enhancement of material measurement techniques

A total of ca. 200 licences have been implemented on 6 continents

Diverse client base, from radioaonomy laboratories (e.g. NRAO in US) to word’s leading domestic microwave oven manufacturers; microwave imaging is also supported by QuickWave, from biomedical devices to industrial microscopy of materials.

What distinguishes QWED from its larger competitors is openness towards emerging technologies and niche markets.

QWED seeks collaborations
- to develop new material models for QuickWave
- to develop new physical solvers
- to develop interfaces to other physical processes
- promoting modelling & education

QWED seeks collaborations in research projects

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