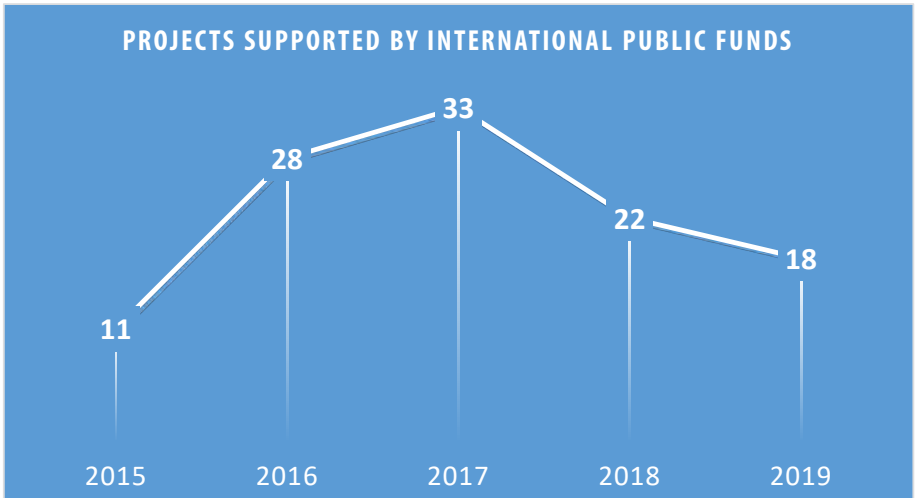
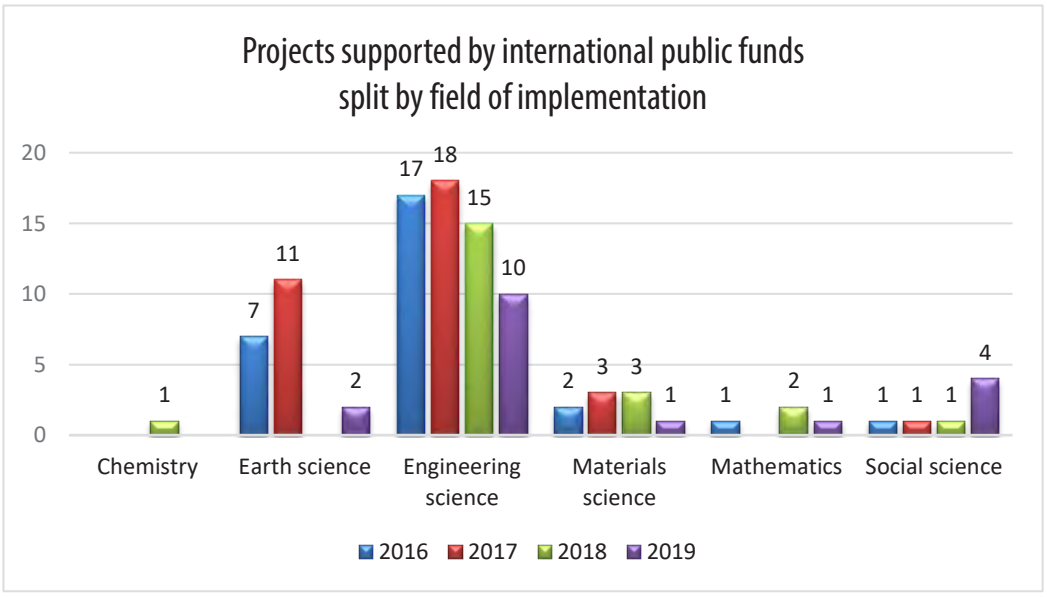
International Research Projects

PROJECTS SUPPORTED BY INTERNATIONAL PUBLIC FUNDS IMPLEMENTED BY UPT 2019

Field	Total number of projects	Number of projects presented
Earth science	2	-
Engineering science	10	6
Materials science	1	1
Mathematics	1	1
Social science	4	1
Total	18	9

EVOLUTION OF PROJECTS SUPPORTED BY INTERNATIONAL PUBLIC FUNDS IMPLEMENTED BY UPT 2015 - 2019





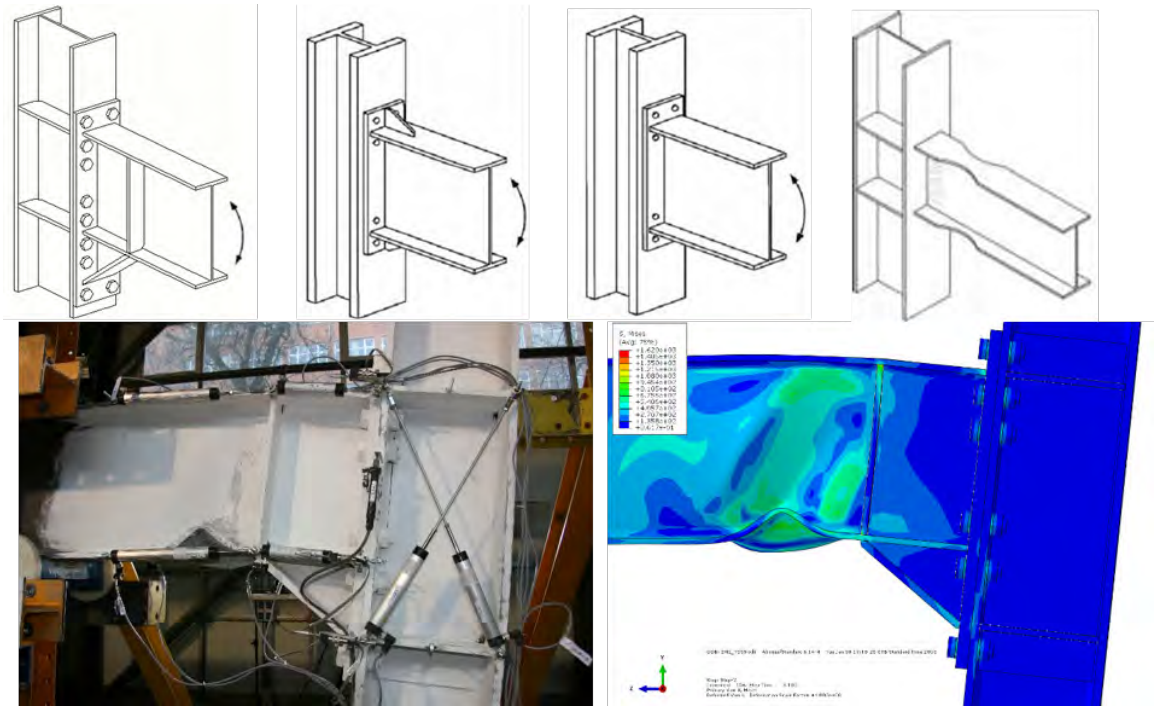
VALORISATION OF KNOWLEDGE FOR EUROPEAN PRE-QUALIFIED STEEL JOINTS

Goal of the project

The project aimed at valorization and extension of the seismic prequalification criteria of a set of steel beam-to-column joints by dissemination to a wide of academic institutions, engineers and architects, construction companies, and steel producers by producing informative documents, design guidelines and organizing seminars and workshops.

Short description of the project

The project developed design guidelines for seismically prequalified steel moment resisting beam-to-column.



Implementation period

01.07.2017 – 30.06.2019

Project implemented by

UNIVERSITA DEGLI STUDI DI NAPOLI FEDERICO II (UNINA) - coordinator
ARCELORMITTAL BELVAL & DIFFERDANGE SA (AMBD)
UNIVERSITE DE LIEGE (ULG)
POLITEHNICA UNIVERSITY TIMIȘOARA(UPT)
UNIVERSIDADE DE COIMBRA (UC)
EUROPEAN CONVENTION FOR CONSTRUCTIONAL STEELWORK (ECCS)
UNIVERSITA DEGLI STUDI DI SALERNO (UNISA)
IMPERIAL COLLEGE OF SCIENCE TECHNOLOGY AND MEDICINE (Imperial)
Centre Technique Industriel de la Construction Metallique (CTICM)
NATIONAL TECHNICAL UNIVERSITY OF ATHENS (NTUA)
CESKE VYSOKE UCENI TECHNICKE V PRAZE (CVUT)
TECHNISCHE UNIVERSITEIT DELFT (TU Delft)
UNIVERZA V LJUBLJANI (UL)
UNIVERSITET PO ARCHITEKTURA STROITELSTVO I GEODEZIJA (UASG)
UNIVERSITAT POLITECNICA DE CATALUNYA (UPC)
RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE AACHEN (RWTH AACHEN)

Main activities

- Development of informative documents for the 4 beam-to-column joints qualified within the EQUALJOINTS project and translation of these documents from English to 11 additional languages
- Development of recommendations and criteria to be used in setting up limits of applicability between EN 1993:1-8 and EN 1998-1. A set of requirements within EN 1090-2 were defined. The documents were drafted as pre-normative design recommendation in English which were translated 11 additional languages
- Development of guidelines for design and analysis of seismic resistant steel structures accounting for the behaviour of beam-to-column joints. In addition, examples for different structural systems were presented which show the influence of different joint typologies.
- Enhancement of the EQUALJOINTS Matlab software for analytical prediction of the cyclic response of joints, allowing an easy application by users in practice. Moreover, an EQUALJOINTS-app for mobile phone was developed.
- Preparation of the material that was disseminated in English and translation in the mother tongue of the places where seminars/ workshop were taken.
- Organization of 14 workshops and seminars where the pre-normative design guidelines were disseminated. In addition, the materials are available in printed forms and downloadable from the project website.

Results

The prequalification criteria for the 4 typologies of steel moment resisting beam-to-column joints from the EQUALJOINTS project (3 bolted connections and 1 reduced beam section – dog-bone) are being considered for the implementation in the next version of the European seismic design code. Informative documents and pre-normative design recommendations were developed, published and distributed during the project workshops, and downloadable from the project website (https://www.steelconstruct.com/eu-projects/equaljoints/).

Financed through/by

Research Fund for Coal and Steel, grant agreement RFCS 12/04/2017 – number 754048

Research Centre

The Research Centre for Mechanics of Materials and Structural Safety – CEMSIG

Applicability and transferability of the results

- Use of the new versions of design codes with simplified procedures for designing steel moment resisting beam-to-column joints.
- The rotational capacity and ductility demand of the joints required by the current codes are assured using the prequalification seismic design criteria.
- Increased structural safety against the seismic hazard in large parts of Europe.
- Improvement in life cycle costs and sustainability due to the reduction of losses caused by seismic hazards.

Research Team

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PROVISIONS FOR GREATER REUSE OF STEEL STRUCTURES - PROGRESS

Goal of the project

The PROGRESS project will provide methodologies, tools and recommendations on reusing steel-based components from existing and planned buildings. The project particularly targets the design for deconstruction and reuse of envelopes, load-bearing frames, trusses and secondary elements of single-storey buildings framed in steel. This building type has broad applicability as industrial, commercial, sports, exhibition, warehouse facilities, and shows most potential in suitability for reuse and viability for circular economy business models. The whole life benefits of reusable single-storey steel buildings will be quantified from environmental and economic viewpoints. The outcomes will be extensively disseminated in particular among manufacturers, designers, contractors and researchers.

Short description of the project

The main objective of the proposal is to develop products, systems, methods and protocols that facilitate reuse of various components of steel-framed single-storey buildings. The proposed project addresses both deconstruction and reuse of existing buildings and how new buildings can be designed, constructed and documented to facilitate future reuse. Its scope includes: (a) primary structures (frames), (b) secondary structures, (c) envelope components and hybrid multi-material systems.

Project implemented by

VTT Technical Research Centre of Finland Ltd., (VTT, Finland)

Implementation period

01.07.2017-30.06.2020

Main activities

- review of the experiences from the successful reuse and deconstruction projects collected by the project partners and from the practitioners in the building industry;

Table 1. Reuse scenarios

	In-situ	Same site		Different site	
		Same configuration	Different configuration	Same configuration	Different configuration
Entire primary structure	A	B	C	D	E
Elements of the primary structure	N/A	N/A	F	N/A	G
Individual elements	N/A	N/A	H	N/A	I

- propose methods for the assessment of suitability of materials and elements for the reuse, including recommendations for their modification/adaptation to fit in the new design;
- propose technical recommendations for the increase of reusability of the components to be provided on component and building design levels.
- propose novel hybrid solutions for envelopes of single-storey buildings, either new buildings or renovation projects, that improves the thermal performance of the entire building, service life of envelopes and reusability of solutions themselves;
- propose a methodology to quantify and declare the environmental benefits of reused elements, resulting in recommendations on the circularity and LCA methodology;
- provide benchmark for demolition, classification and testing/ verification protocols developed on a real deconstructed building including the laboratory tests to identify mechanical and chemical properties of the materials;
- design case studies to cover the most common reuse situations.

Results

- The outcomes of the project will include recommendations to:
- Reduce the technical barriers to reuse through establishing the quality verification procedures for the structural elements and envelopes of deconstructed low-rise buildings to be reused;
- Simplify the implementation of reusable components through recommendations for design for deconstruction and reuse, and for design using reclaimed elements as well as for safe and efficient deconstruction activities;
- Support the product manufacturers', facility owners' and designers' decision making by recommended methodology to calculate the environmental impact and cost of steel components reusing;
- Develop an online reused steel trading portal to co-ordinate the supply and demand for reused steel-based components;
- Develop novel types of hybrid solutions for envelopes in order to improve the thermal performance of a building, extend the service life of an envelope and maximize the reuse potential of components.

Applicability and transferability of the results

The majority of existing steel low-rise buildings can be deconstructed into elements such as cold-formed or hot-rolled sections, sheets, panels, frames or truss girders. These components have very high reuse potential, but require verification of the material quality, dimensions and tolerances in order to be included in new building projects. The future reuse of modern buildings, however, may be different, because those structures are increasingly designed as systems and their design information can be easily maintained for instance as a building information model (BIM).

Financed through/by

Research Fund for Coal and Steel, EU, grant agreement No 747847.

Research Centre

Research Center for Mechanics of Materials and Structural Safety (CEMSIG), Politehnica University Timişoara

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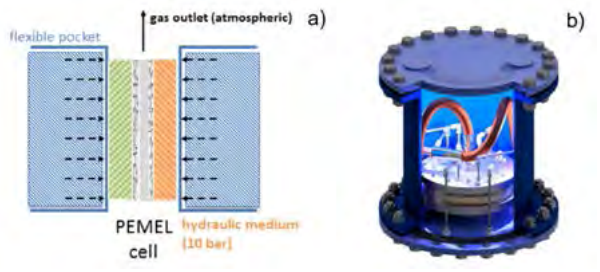
NOVEL MODULAR STACK DESIGN FOR HIGH PRESSURE PEM WATER ELECTROLYZER TECHNOLOGY WITH WIDE OPERATION RANGE AND REDUCED COST (PRETZEL)

Goal of the project

Green hydrogen produced by electrolysis might become a key energy carrier for the implementation of renewable energy as a cross-sectional connection between the energy sector, industry and mobility. Proton exchange membrane electrolyzer (PEMEL) is the preferred technology for this purpose, still costs, efficiency, lifetime and operability need to be optimized. The aim of PRETZEL project is to develop a new PEMEL that provides significant improvements in efficiency and operability to satisfy emerging market requirements.

Short description of the project

The central objective of PRETZEL is to develop a new PEMEL for hydrogen production, upscaling a patented design approach based on hydraulic cell compression.



Principle of homogeneous hydraulic cell compression (a) and stack design for hydraulic compression (b).

The system will operate with a maximum energy consumption of 25 kWh, with a production capacity of 4.5 m^3 H_2 / h at rated power, at a pressure of 100 bar and water temperature of 90°C.
All subsystems needed to properly operate a PEMEL stack will be integrated in a housing, equipped with a hydrogen detection and ventilation system.

Schematic drawing of a PEMEL system as container solution by iGas energy.

Project implemented by:

Project Coordinator:
German Aerospace Center, Stuttgart, Germany (DLR)

EU Partners:

- Westphalian University of Applied Sciences, Germany (WHS)
- Association for Research and Development of Industrial Methods and Processes, France (ARMINES)
- Politehnica University Timișoara, Romania (UPT)
- Adamant Composites Ltd., Greece
- GKN Sinter Metals Engineering GmbH, Germany (GKN)
- Centre for Research and Technology Hellas, Greece (CERTH)
- Soluciones Catalíticas IBERCAT, Spain
- iGas energy GmbH, Germany

"PRETZEL"-like shape passing over the geographical location of all PRETZEL partners representing the long-term collaboration in know-how, supply chain, business partnership and R&D.

Implementation period

01.01.2018 – 31.12.2020

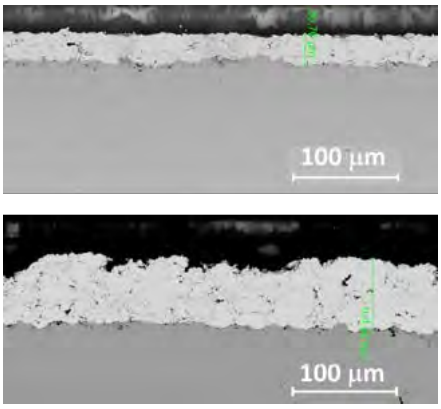
Main activities

UPT's main activities in PRETZEL are the investigation of newly developed bipolar plates (BPP), as cost-efficient alternative for the classical titanium BPP, consisting of highly corrosion resistant Nb-coatings deposited by vacuum plasma spraying (VPS) on copper pole plates in regard of:

- **Corrosion resistance** evaluation in simulated PEMEL environment, at 90°C and O_2 saturated solution, including accelerated stress tests at constant potential of 2 V applied for 6 hours
- **Interfacial contact resistance** (ICR) versus compaction force measurement
- **Structure and morphology** of BPP before and after accelerated stress tests

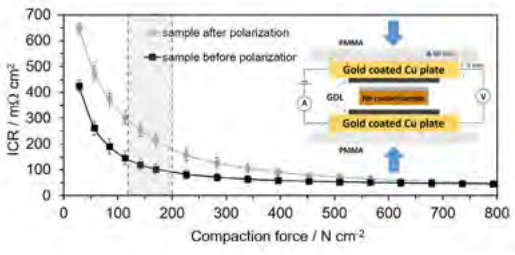
Results

- A 30 µm thick Nb coating fully protects the copper substrate against corrosion in simulated PEMEL environment, showing excellent corrosion resistance properties, with i_{corr} lower than 0.1 µA cm^{-2}.
- Cross-section images show no signs of corrosion, nor the formation of pinholes beneath the coating.



Cross section FE-SEM images of Nb-coatings after accelerated stress test.

• ICR decreases with compaction force up to 45 mΩ cm^2. In the range of 120 to 200 N cm^{-2}, which is the common pressure applied for assembling commercial PEM electrolyzer stacks, ICR decreases from 130 to 90 mΩ cm^2.



Interfacial contact resistance at different compaction forces.

Applicability and transferability of the results:

- **System:** Development and validation of a 25 kW PEM electrolyzer system with hydrogen output pressure of 100 bars or higher.
- **Cell components:** Reduction of Ir catalyst loading compared to the state-of-the-art, by the use of new aerogel supports.
- **Protocols:** development of complete protocols for BPP testing, including stress test, corrosion resistance and ICR.

Financed through/by

Fuel Cell and Hydrogen 2 Joint Undertaking under the European Union´s Horizon 2020 research and innovation programme under grant agreement No 779478.

Research Centre

Research Institute for Renewable Energy (ICER-TM), UPT

Research team

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REDOUBT - RELIABLE FPGA DATAPATH DESIGN USING CONTROL TECHNIQUES, CONTRACT ESA - 4000123993/18/NL/CRS

Goal of the project

This project proposes a novel control theory inspired fault tolerant methodology for FPGA implementations of processing data-paths working in harsh radiation space environments. The proposed methodology will rely on adding control loops, which will detect and correct the radiation induced faults. We will consider the data-path processing component as a process, for which control components will be added in order to increase the fault tolerance.

The main objectives of this project are:

1. Development of the theoretical background for the control engineering inspired fault tolerant mechanism
2. FPGA implementation for the fault tolerant data-path with control feedback loops
3. Analysis of the proposed methodology in terms of cost and fault tolerance, and comparison with other approaches, such as triple modular redundancy (TMR), reduced precision replicas (RPR), or redundant residue number systems (RRNS).

The proposed technique will target arithmetic dominant applications, which include digital signal processing, robotic arm control, or graphic processing.

Short description of the project

We aim at providing a novel fault tolerant technique for FPGA based digital electronics used in space applications.

Project implemented by

Politehnica University Timișoara (UPT) -lead,
Universitatea Tehnică din Cluj-Napoca (UTCN)- project partner.

Implementation period

July 2018 - June 2019

Main activities

We will investigate the cost and fault tolerance characteristics of the proposed technique, determining the advantages and the pitfalls. Thus, we will provide the theoretical foundation, a proof-of-concept implementation, as well as guidelines and characteristics for the control based reliability enhancement technique.

The project requires the following four steps:

1. SFI for the target datapath circuit in order to characterize the fault behaviour - This step will require RTL model of the targeted arithmetic intensive circuit, as well as performing the SFI at RTL for the implemented circuit.

2. Analytical modelling for the faulty datapath circuits – This step involves determining the high level modelling of faults, and developing the model associated to the process with perturbations. This step will consist of Matlab simulations.

3. Theoretical controller design used for error correction – In this step, the feedback controller will be designed in order to attenuate and mitigate the perturbations within the process associated to the faulty arithmetic datapath. The controller will be developed in Matlab

4. FPGA implementation and SFI based validation – This step will comprise of the RTL model of the control enhanced fault tolerant circuit, and its evaluation in terms of cost (FPGA implementation cost) and fault tolerance (using SFI). Comparisons with TMR, RRNS and RPR will be performed.

Results

- We have developed a fault tolerant digital circuit methodology that uses correction feedback loops in order to mitigate the magnitude of errors in data processing circuits.
- The feedback loops implement a linear controller, while the correction process is performed during several iterations.
- The obtained results have indicated that significant cost savings with respect to conventional fault tolerant methodologies, such as TMR, can be obtained.

Applicability and transferability of the results

- The REDOUBT project has been finalized, with a novel methodology for fault tolerant circuit design, based on control engineering, being developed.

Financed through/by

Agenția Spațială Europeană (European Space Agency – ESA)

Research centre

Research Centre for Computers and Information Technology

Research team

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COMBINATORIAL DESIGN OF NOVEL BIPOLAR PLATE COATINGS FOR PROTON EXCHANGE MEMBRANE ELECTROLYZERS (CODE-PEM)- EEA-RO-NO-2018-0502

Goal of the project

The CoDe-PEM project aims to contribute towards the development of affordable PEM electrolysis systems with the development of lower cost coating materials for bipolar plates and sinters. In order to lower the costs, a reduction in use of expensive materials and the introduction of new low(er) cost materials are key elements. In addition, new materials should allow for fast and low-cost manufacturing processes, such as stamping of BPP flow structures.

Short description of the project

Via an interdisciplinary partnership, the project aims to integrate research groups with complementary experience in materials development and hydrogen technologies of groups from the Institute of Renewable Energy from Politehnica University Timisoara (UPT) with the research groups New Energy Solutions and Corrosion and tribology, both within the institute of industry in SINTEF, see below.

In order to reach the goals of the project, the challenges related to the plate cost, corrosion, interfacial contact resistance (ICR) of the MEA/sinter/BPP stack and the materials durability will be addressed. This will be achieved by identifying optimal material compositions that avoids rapid performance degradation due to the formation of electrically resistive surface oxides, and that prevents contamination by potential dissolved ions from corrosion of the substrate (metal) plates.

Project implemented by

Politehnica Universitiy Timisoara, Romania
SINTEF Trondheim, Norway

Implementation period

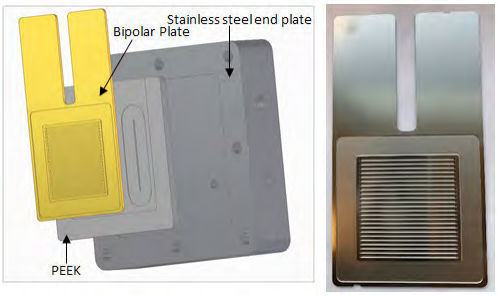
2019-2023

Main activities

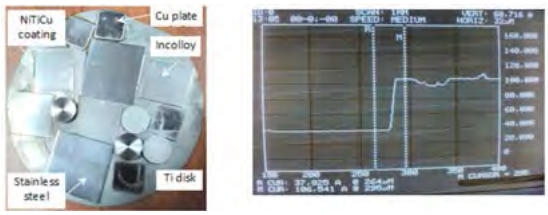
- Preparation of a database with potential materials systems for substrate-coating couples to be used for the fabrication BPP.
- Installation and upgrade of the combinatorial exploration system in UPT. A state of the art system is planned to be developed in UPT to allow the manufacture of compositional spreads out of several targets and with the possibility to grade libraries thickness.
- Preparation of the ex- and in-situ experimental set-up at SINTEF, including the test cell with online ICR monitoring.
- Ex situ- characterized libraries that will provide the information needed to tune up the combinatorial system and to adjust the composition range for the experiments.
- Optimized coating will results following the combinatorial - exploration – tests - manufacture - test iterative sequence.
- Ex situ and in situ characterized BPP that will provide further functional information for the optimization process

Results

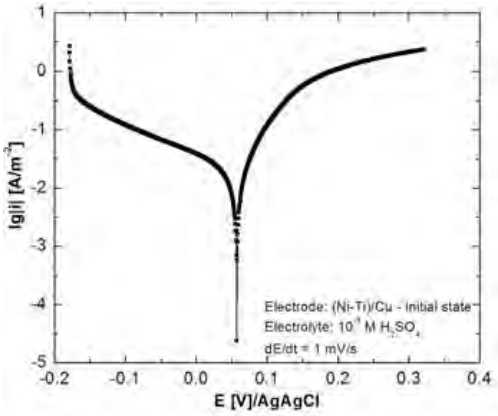
Finished design of electrolyzer test cell (left) Stainless steel BPP (right)

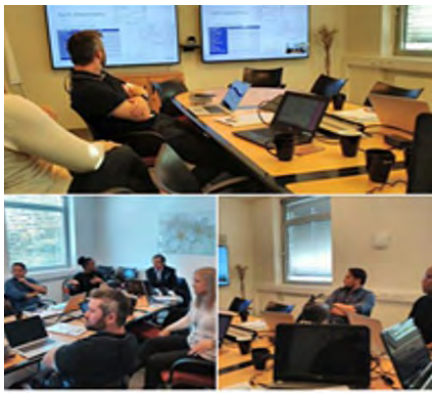


Different substrates with NiTiCu films deposited by magnetron sputtering (left) and the measurement of the film thickness (right)



Linear polarization curves (Tafel plots) on (Ni-Ti)/Cu electrode in H2SO4 10-3 M + 0.1 ppm F-1 at room temperature recorded at 1mV/s scan rate.





Partner's meeting in SINTEF

Applicability and transferability of the results

- The CoDe-PEM project will contribute to the Energy efficiency by focusing on identifying lower cost materials for electrolysers so that the cost of electrolyser systems can significantly be reduced.

Financed through/by

SEE Financial Mechanism (EEA Grants), 2014-2021

Research centre

Politehnica University Timisoara:
Combinatorial exploration group
Fuel cells group
SINTEF:
New energy solutions group
Corrosion and tribology group

Research team

Politehnica University Timisoara:
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Prof. Nicolae Vaszilcsin
Prof. Mircea Dan
Prof. Ion Mitelea
Prof. Aurel Ercuta
Ph D. student Roxana Sprancenatu
Ph D. student Vlad Bolocan
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EASTERN EUROPEAN TWINNING ON STRUCTURAL INTEGRITY AND RELIABILITY OF ADVANCED MATERIALS OBTAINED THROUGH ADDITIVE MANUFACTURING (SIRAMM)

Goal of the project

The overall objective of the SIRAMM project is to significantly strengthen research in the Additive Manufacturing (AM) field at the University Politehnica Timisoara. To achieve this aim, SIRAMM will build upon the existing science and innovation base of UPT, creating a network with two internationally-leading counterparts at EU level: Norwegian University of Science and Technology (Norway) and the University of Parma (Italy).

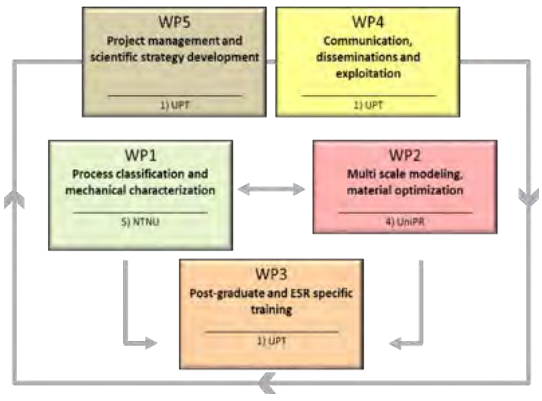
In the long term, the project aims at laying the foundations for creating a pole of excellence on AM in Eastern Europe. For this reason, other two partners from low R&I performing countries, the University of Belgrade (Serbia) and the Institute of Physics of Materials, Academy of Sciences (Czech Republic) also take part in this Twinning project.

Short description of the project

The project will be focused on the implementation of knowledge transfer activities such as workshops and staff exchange, training events (i.e. summer schools, seminars) for early stage researchers, and dissemination and communication actions (i.e. web site, videos, open access publications, public engagement activities) for different audiences.
To keep maintaining the knowledge transfer well beyond the duration of this project, a regular master course on AM technology will be also implemented in the coordinating institution.

Project implemented by

The project work plan has been structured into 5 Work Packages, which address all the key approaches and activities required for the successful achievement of SIRAMM's specific objective.



Implementation period

01.10.2019 – 30.09.2022

Main activities

- Staff exchange between partners
- PhD students exchange
- Seminars for students
- Seminars for companies
- Summer Schools
- Workshops
- International conferences

Results

- Increased research excellence of the coordinating institution and the other widening partners,
- Enhanced reputation, attractiveness and networking channels of the partners,
- Training and professional development of a new generation of scholars,
- Growth of industrial sector,
- Increasing awareness in the general public.

Applicability and transferability of the results

- The proposed novel methodology for integrity and durability will increase the quality assessment methodology of AM components used in automotive, aerospace, and biomedical sectors, due to the higher safety level obtainable and reduced production costs. In particular for the automotive industry, these advances in AM knowledge will create new opportunities in terms of innovative design, resulting in lighter and safer products, with estimated production costs 10-30% lower than the traditional methods.

The project received evidence of interest from Beam-IT, an additive manufacturing company having the biggest machine park in Europe and the corporate Continental, world leader in the mobility sector.

Kick-off meeting, Timișoara, 7-8.11.2019

Financed through/by

European Commission, H2020-WIDESPREAD-2018-03 (action: CSA) under the grant agreement No. 857124

Research centre

"St. Nadasan" Research Laboratory for Strength, Integrity and Durability of materials, structures and conductors.

Research team

1. Coordinator: University Politehnica Timisoara (UPT), Romania
2. Faculty of Mechanical Engineering, University of Belgrade (UBG), Serbia
3. Institute of Physics of Materials, Academy of Sciences of the Czech Republic (IPM), Czech Republic
4. University of Parma (UniPR), Italy
5. Norwegian Univ. of Science and Technology (NTNU), Norway

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LINKING TRANSNATIONAL, MULTIMODAL TRAVELLER INFORMATION AND JOURNEY PLANNERS FOR ENVIRONMENTALLY-FRIENDLY MOBILITY IN THE DANUBE REGION

Goal of the project

There is a huge cross-border travel demand within the EU leading to hundred millions of cross-border trips every year by EU residents and further several hundred million trips by international tourists. More than 100 providers of traveller information services exist in Europe covering different levels, from local to regional, national and pan-European. The goal is to work on the inter-linking of existing services in order to enable transnational journey planning that goes beyond the territory covered by the single systems and offers travellers one seamless journey planning result.

Short description of the project

The objective is to develop a decentralised system architecture that enables distributed journey planning.

Project implemented by

An international consortium of journey planner- and transport operators in the frame of the INTERREG project "LinkingDanube" from Austria, Czech Republic, Hungary, Slovakia, Slovenia and Romania (with two partners, UPT and Electronic Solutions Ltd.)

Implementation period

01.01.2017 – 30.06.2019

Main activities

In particular the main objective is to develop a decentralised system architecture that enables distributed journey planning. By developing and establishing a common interface at each of the involved systems, the exchange of requests and results (not data) will be facilitated. The multiple responses of the involved systems have to be merged by means of an intelligent journey planner algorithm. The involved systems will engineer an application programming interface (open API) that allows bi-directional communication of the enquirer system (the system requesting information from other systems) and the responding systems. A common exchange specification will be developed that all participating systems will implement. Besides the method of implementing common gazetteers and exchange points within the distributed system will be one of the crucial points.

Results

The actual development work of LinkingDanube will be done both on national level in a decentralised adaption of the national journey planners as well as on central level in setting up a central entity. In the end this means that national services will be able to "plug into" a common interface and provide seamless information from multiple systems to cross-border travellers. After implementation and testing, the technical feasibility will be demonstrated for the respective regions in relevant use cases.
The pilot action will demonstrate, test and validate the developed concept and demonstrate how integrated journey planning helps to connect citizens and commuters across borders and rural regions to major hubs. In this way the demonstrations will be the basis for further large-scale implementation.

Applicability and transferability of the results:

A central focus of LinkingDanube is the development of a concept for transnational multimodal journey planners in order to integrate the advantages of hub-to-hub-routing with local routing for cross-border regions and the elaboration of technical specifications for interface and data exchange. This concept shall build on existing structures in the partner countries, enhancing existing journey planners instead of creating a completely new structure and is completely transferable.

Financed through/by

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CONTRIBUTIONS TO CODIMENSION K BIFURCATIONS IN DYNAMICAL SYSTEMS THEORY

Goal of the project

The overall project objectives are to produce new knowledge in the area of codim k bifurcations for continuous and discrete (smooth and non-smooth) dynamical systems and provide training in this area of research to early stage researchers.

Short description of the project

The project achieves its objectives during secondments.

Project implemented by

1. Politehnica University Timișoara (Coordinator)
2. Autonoma University of Barcelona
3. Obuda University
4. West University of Timisoara
5. University of Craiova
6. Acmit Gmbh, Austria
7. University North Caroline at Charlotte
8. Shanghai Jiao Tong University, China
9. University of Sao Paulo, Brazil

Implementation period

1 April 2018 - 31 March 2022

Main activities

1. Study degenerate Bautin bifurcations;
2. Study degenerate Hopf-Hopf bifurcations;
3. Study other codimension k bifurcations in continuous (smooth) systems;
4. Study other codimension k bifurcations in discrete (smooth) systems;
5. Study codim k bifurcations in non-smooth systems;
6. Study bifurcations in non-smooth systems with impacts.

Results

Published articles:

1. L. Barreira, J. Llibre, C. Valls. Bounded polynomial vector fields in R^2 and R^n. J. Diff Equations, 268, 4416-4422, 2020.
2. J. Llibre, R. Oliveira, C. Rodrigues. Limit cycles for two classes of control piecewise linear differential systems. Sao Paulo J. Math. Sci., 1-17, 2020.
3. C. Rocsoreanu, M. Sterpu, Approximations of the heteroclinic orbits near a double-zero bifurcation, (IJBC), Vol. 29, No. 6 (2019) 1950074.

Financed through/by

Horizon2020-2017-RISE-777911, "Dynamics"

Research team

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ARCHITECTURAL STRATEGIES FOR ROMANIAN CHILDREN FROM ABROAD

Goal of the project

A special perspective is needed when we speak of this special category, of children at risk, where the architecture and programs created for them will have to go beyond their usual limits, being necessary to fulfill and the curative aspect, beneficial for the manifestation of their resilience.

This research aimed to study the main factors involved in trying to find the ideal formula that connects them with the Romanian culture, art and architecture, thus facilitating their reintegration in the case of returning to the country and at the same time to be able to create a spatial identity in a foreign country with which does not identify.

Short description of the project

Realizing a research on the Romanian children who live abroad in Veneto Region in order to discover their relationship with the Romanian architecture.

Project implemented by

- Faculty of Architecture and Urbanism, Politehnica Timisoara University
- „Instituto Romeno di Cultura e Ricerca Umanistica di Venezia", obtained with the support of the Romanian state through the national scholarship program „Nicolae Iorga".

Implementation period

13 January 2019- 13 October 2019

Main activities

This research focused on colecting datas and informations about the current situation of Romanian children living abroad, on how they perceive art, architecture and traditional architecture and were realized creative workshops that wanted to bring them closer to Romanian traditional art and architecture:

- 4 April 2019- «Micii Arhitecți» organized in partnership with the Faculty of Architecture and Urbanism, Politehnica Timișoara and the non-governmental association AlternativEd Lugoj.
- 24 June 2019- «Portul tradițional românesc » organized in partnership with the Faculty of Architecture and Urbanism, Politehnica Timișoara and the non-governmental association AlternativEd Lugoj.

It was also organized a masterclass-

- „L'eternita architettonica di una citta storica e la modernita"- for the students from Politehnica University, Faculty of Architecture and Urbanism, organized by „Instituto Romeno di Cultura e Ricerca Umanistica di Venezia" in partnership with the Faculty of Architecture and Urbanism on the 19 september 2019.

Results

- Finding solutions and proposing new strategies for rehabilitation and reintegration of all these categories of children in risk situations requires an interdisciplinary analysis, not being able to talk about the elaboration of new architectural programs for these children without taking into account the psychological, social, economic and political. A solution with a particular problem requires a separate approach that is not one-way.

- This paper presents only the start of the final research. Furteher researches are needed in order to compare the results with the Romanian children raised in the country and also with the Romanian children raised in other European countries. After that the research results will be more strongly supported and will give a better perspective of what architectural strategies can be implemented in order to achive the purpose goal.

Applicability and transferability of the results

- These architectural strategies are trying to facilitate the reintegration of Romanian children already living in a foreign country in the case of returning home and at the same time to be able to create a spatial identity in a foreign country with which does not identify when they move there with their families.

Financed through/by

Ministry of National Education and Scientific Research
"Nicolae Iorga" postdoctoral research and training scholarships at the Romanian Institute of Humanistic Culture and Research in Venice.

Research centre

„Instituto Romeno di Cultura e Ricerca Umanistica di Venezia".

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