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Workshop on Monitoring and Diagnostics of Fuel Cells

Innovative on-board diagnosis towards fuel cells performance enhancement

13 November 2018 – Brussels (B)

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venue Manos Conference Center, Chaussée de Charleroi, 135 B-1060
http://www.manosconference.com

registration: http://bit.ly/workshopfcdiagnostics2018

Info: http://pemfc.health-code.eu/ – http://insight-project.eu/

The workshop presents the current status and the most recent advancements concerning research on monitoring, diagnostics and control of both PEMFC and SOFC. It is jointly organized by the projects HEALTH-CODE and INSIGHT. Both projects provide advanced monitoring and diagnostic solutions towards improved performance, better management and maintenance scheduling, aiming at higher reliability and increased lifetime of PEMFC and SOFC technologies.

HEALTH-CODE focuses on developing an advanced Monitoring, Diagnostic and Lifetime Tool (MDLT) for μ-CHP and backup PEMFC systems equipped with air- and O2-fed stacks, respectively. Such a tool is based on the measurement of the Electrochemical Impedance Spectrum (EIS) while the stack is running in real operations. EIS allows the identification of FC current status to support the detection of five stack failure modes, as well as inferring on its remaining useful life.

The INSIGHT project aims at developing an MDLT for SOFC stacks based on EIS, Total Harmonic Distortion (THD) and Pseudo-Random Binary Sequence (PRBS) methods. The hardware necessary for its implementation into a real SOFC system is improved for on-board implementation of such approaches focusing on three different stack faults. The effectiveness of the MDLT is demonstrated through tests on a real micro-Combined Heat and Power system.

The workshop will gather engineers and researchers from industry, academia and research institutions interested in the most recent advancements on monitoring and diagnostic tools. Emphasis is given to methodological approaches for advanced diagnosis that can help achieving enhanced performance of both PEMFC and SOFC systems. A comprehensive overview and the exploitation potential of the projects results are offered to the interested stakeholders and users at various levels.

The workshop will start with an introduction on the EU Joint Undertaking for Fuel Cells & Hydrogen (FCH) along with a presentation of the EU JU ECSEL active in the field of Electronic Components and Systems. An overview of the projects will start the technical session; then, main results will be reported on the experimental activity and on various approaches for monitoring and diagnostics. Scientists and engineers from 15 teams will present their activities, bringing their knowledge, expertise and perspectives. Invited guests from industry will also offer a further look into key topics tightly connected to monitoring and diagnostics of both PEMFC and SOFC. Exploitation and market opportunities of the projects results will be analysed and discussed with a representative from the European Commission Support Services for Exploitation of Research Results (SSERR).

A final open discussion among the attendees will be set to share experience and draft future paths towards FC improvements via on-board diagnostics.

Registration is free of charge, please visit this page.

Coffee, beverages and networking cocktail will be offered to all guests.

The project HEALTH-CODE (Real operation pem fuel cells HEALTH-state monitoring and diagnosis based on dc-dc COnverter embeddeD Eis) has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking under grant agreement No 671486. This Joint Undertaking receives support from the European Unions' Horizon 2020 research & innovation programme and N.ERGHY.
The project INSIGHT (ImplementatioN in real SOFC Systems of monItoring and diaGnostic tools using signal analysis to increase tHeir lifeTime) has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking under grant agreement No 735918. This Joint Undertaking receives support from the European Unions' Horizon 2020 research & innovation programme and Hydrogen Europe and N.ERGHY.

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FINAL PROGRAM

Time	Topic	Speaker	Affiliation
13:00-13:20	**Registration, Coffee and Welcome**		
13:20-13:40	FCH2 & ECSEL Joint Undertaking Presentation	A. Aguillo-Rullan F. Ignacio	FCH-JU ECSEL-JU
13:40-13:50	Diagnostics, Prognostics and Control of FCS Motivations, challenges and main issues	J. Mougin C. Pianese	CEA UNISA
13:50-14:05	Description of project HEALTH-CODE	C. Pianese	UNISA
14:05-14:20	Description of project INSIGHT	J. Mougin	CEA
14:20-14:40	EIS characterization of air- and O2-fed PEMFCs under five faulty operations	S. S. Araya	AAU
14:40-15:00	EIS, THD and PRBS characterization of SOFC under three faulty operations	B. Morel	CEA
15:00-15:20	HW and SW for on-board implementation of EIS	G. Petrone	UNISA
15:20-15:40	**Coffee break**		
15:40-16:00	PEMFCs EIS-based diagnostics and implementation	M.C. Péra	UFC
16:00-16:20	Perturbation based SOFC diagnostic techniques	Đ. Juričić	IJS
16:20-16:40	Exploitation and market opportunities	D. Mazzella	Meta-SSERR
16:40-17:00	Role of diagnosis, monitoring, control and maintenance for Fuel Cell commercial product	Y. Stévenin	Powidian
17:00-17:20	High Power PEMFC System development: From test bench to modular FC Stack for stationary uses	A. Rakotondbrainibe	Areva
17:20-17:40	Role of diagnostics and control on future SOC products for improved performance and durability	O. Bücheli	SOLIDPower
17:40-18:00	Discussion among guests, partners, participants	All	
18:00	Closure	J. Mougin, C.Pianese	CEA, UNISA
	Networking cocktail		

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Coffee, beverages and networking cocktail will be offered to all guests.

HEALTH-CODE: AAU, Aalborg University (DK); AK, Absiskey (F); BPSE, Ballard Power System Europe (DK); BIT, Bitron Industrie S.p.A. (I); EIFER, European Institute for Energy Research (D); EPS ELVI ENERGY, Electro Power System S.p.A. (I); UFC, University of Franche-Comté (F); UNISA, University of Salerno (I).

INSIGHT: AK, Absiskey (F); AVL, AVL List GmbH (A); BIT, Bitron Industrie S.p.A. (I); CEA, French Atomic and Alternative Energies Commission (F); DTU, Technical University of Denmark (DK); EPFL, École Polytechnique Fédérale de Lausanne (CH); HTC, HTceramix SA (CH); IJS, Jožef Stefan Institute (SI); SP, SOLIDpower S.p.A. (I); UNISA, University of Salerno (I); VTT, Technical Research Centre of Finland (FI).

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