



جامعة مولاي إسماعيل  
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 UNIVERSITÉ MOULAY ISMAÏL



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كلية العلوم  
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 FACULTÉ DES SCIENCES



# The 10th Conference on Environmental Instrumentation and Measurements **EnvIMEKO'10**

## SMART AGRICULTURE FOR WELL-BEING

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7-8  
 December  
 2023



Faculty of Sciences, MEKNES



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#10<sup>th</sup> EDITION



#EnvIMEKO



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# SMART AGRICULTURE FOR WELL-BEING



[www.bachmek.umi.ac.ma/EnvIMEKO10](http://www.bachmek.umi.ac.ma/EnvIMEKO10)

# Program of **EnvIMEKO'10**

## SMART AGRICULTURE FOR WELL-BEING

December **07** , 2023

Conference room, Faculty of Sciences-Meknes

Thu Dec 7th, 2023	08h00-09h00	Welcome of participants	
	09h00-10h00	Opening ceremony	Pr. Ahmed MOUCHTACHI, President of Moulay Ismail University
			Pr. Abdellah Mir, Dean of the Faculty of Sciences Meknes
			Pr. Aimé LAY-EKUAKILLE, President of EnvIMEKO, University Of Salento, Italy.
			Pr. Hmidou ELOUARDI, On behalf of the Organizing Committee
	Chairmen : Pr. Lahcen HSSAINI and Pr. Lhoussain HAJJI		
	10h00-10h30	«From lab to nature – sustainable hydrogels to help mitigate drought » > Pr. Jürgen PETRRAK/ Pr. Markus BIEL, ACUAS, Allemagne	
	10h30-11h00	« Digital Agriculture Technologies for Irrigation: Field Research and Applications » > Pr. Kamal ABERKANI, FP Nador, Oujda.	
	11h00-11h20	Discussions	
	11h20-11h45	Coffee break	
	Chairmen : Pr. Abdellah El Hmaïdi and Pr. Nourdin YAAKOUBI		
	11h45-12h15	«Addressing Water Scarcity: Innovating Agriculture through 'Irrismart' App and Deficit Irrigation in Morocco» > Pr. Aziz ABOUABELLAH, ENA-Meknès.	
	12h15-12h45	«Impact des changements climatiques sur l'agriculture et les ressources en eaux» > Dr. Rachid MRABET, INRA, Maroc.	
	12h45-13h05	Discussions	
	13h05-13h30	Lunch break	
	Chairmen : Pr. Youness ZEGZOUTI FILALI, Pr. Youness ACHAQUI and Pr. Najla FOURATI		
	15h00-15h30	«Food safety and mycotoxins : the role of crop husbandry» > Pr. Geert HAESAERT, U-Ghent, Belgique	
	15h30-16h00	« Matériaux du patrimoine culturel et objets d'art : Apport des spectrométries optiques dans la documentation scientifique » Pr. Saadia AIT LYAZIDI , FSM-Meknès	

# Program of **EnvIMEKO'10**

## SMART AGRICULTURE FOR WELL-BEING

December **07** , 2023

Conference room, Faculty of Sciences-Meknes

Thu Dec 7th, 2023	16h00-16h20	Discussions
	16h20-16h45	Coffee break and DAY 1-Poster
	16h45-18h15	DAY 1 -Communication sessions

December **08**, 2023

Conference room, Faculty of Sciences-Meknes

Fr Dec 8th, 2023	Chairmen : Pr. Hassan HAJJAJ ; Pr. Hamid MAZOUZ and Pr. Mohamed EL AMRAOUI	
	9h00-9h30	« Valorization of agro-industrial co-products : Molecular platform source and circular economy concept » Pr. Hassan HAJJAJ, FSM-Meknès
	9h30-10h00	«Mitigating climate change by material design and engineering : Energy storage and hydrogen production/utilization» > Pr. Fouad GHAMOUISS, Université Polytechnique, Ben Guerir.
	10h00-10h20	Discussions
	10h20-10h50	Coffee break and DAY 2-Poster
	Chairmen : Pr. Ali OUBELKACEM and Pr. Ali BEKRI	
	10h50-11h20	«Smart sensors for the monitoring of water pollutants » >Pr. Najla FOURATI, CNAM de Paris, France/ Pr. Nourdin YAAKOUBI, LMU, France.
	11h20-11h30	Discussions
	11h30-12h30	DAY 2-Communication sessions

# Program of EnvIMEKO'10

## SMART AGRICULTURE FOR WELL-BEING

### Day 1 - Communication sessions

	Session 1	Session 2	Session 3	Session 4
	<b>Chairmen :</b> <ul style="list-style-type: none"> <li>Prs : Mohammed SEBBANE</li> <li>Ali OUBELKACEM</li> <li>Younes BENHOURIA</li> </ul>	<b>Chairmen :</b> <ul style="list-style-type: none"> <li>Lhoussain HAJJI</li> <li>Youness ZEGZOUTI</li> <li>FILALI Lahcen HSSAINI</li> </ul>	<b>Chairmen :</b> <ul style="list-style-type: none"> <li>Mohamed DOUMA</li> <li>Najib TIJANI</li> <li>Abdellah EL HMAÏDI</li> </ul>	<b>Chairmen :</b> <ul style="list-style-type: none"> <li>Mohamed EL AMRAOUI</li> <li>Aumeur EL AMRANI</li> <li>Lahcen BEJJIT</li> <li>Youness ACHAOUI</li> </ul>
16h45- 17h	<b>Mohamed Bouni</b> Precision Agriculture: Machine Learning-Based Crop Recommendation for Optimal Yield and Sustainability	<b>Maachi Dina</b> Effect of Water Shortage on Physiology and Productivity of Genotypes of Eggplants Grown under Mediterranean Climate Conditions in the Northeast of Morocco	<b>Jihane Saouita</b> Use of geomatics and multi-criteria methods in the evaluation of water erosion in the watershed of the Tigrigra (Azrou region, Middle Atlas, Morocco)	<b>Abderrahman Mellalou</b> Photopyrolysis: An Innovative Screening Tool for Assessing Hydrogen Production Potential from Biomass Feedstocks
17h- 17h15	<b>Saadbouh BOUSSAOULA</b> Connected GreenHouse for Precision agriculture and IoT Monitoring System	<b>Elhourri Mohammed</b> Comparative study of the chemical composition of the essential oil of <i>Daucus carota</i> (L.) ssp. <i>carota</i> (Apiaceae) of the Mediterranean and their antimicrobial activity	<b>Youssef Hafidi</b> Biodegradable hydrogels based on poly(aspartic acid-co-lysine) for water management in arid agriculture	<b>Mohamed El Omari</b> Raman and FORS measurements of three mineral stones from Drâa-Tafilalet region, Morocco
17h15- 17h30	<b>Yousra ZAROUIT</b> Comprehensive Study on Robotic Automation for Date Palm Harvesting: Challenges, Innovations, and Sustainable Solutions	<b>Laila Ouardi</b> Assessment of genetic diversity in Moroccan vine ( <i>Vitis vinifera</i> L.) collection by phenotypical and morphological descriptors	<b>Hicham El Hatka</b> Surface modification of flexible polyurethane foams to improve oil-water separation and wastewater treatment	<b>Maurizio Palmisano</b> Shungite : the smart rock
17h30- 17h45	<b>Iman KADIR</b> The impact of learning algorithms on the performance of MLP artificial neural networks for humidity prediction	<b>Sabri Mohamed</b> Chemical characterization and evaluation of the biological activities of the Saffron stigma extracts.	<b>Yousra Ameziane El Hassani</b> Quantitative Assessment of Copper (Cu) Concentrations in Wastewater Irrigated Farms	<b>Radouan Gouaamar</b> Reliable Sliding Mode Power Control for a Wind System Utilizing a DFIG

# Program of **EnvIMEKO'10**

## SMART AGRICULTURE FOR WELL-BEING

<b>17h45-18h</b>	<b>Ayoub Ba-ichou</b> Improving Evapotranspiration Estimation (ETO) by Using Hourly Data and Integrating Long Memory Recursive Neural Networks (LSTM): An Approach with All Possible Combinations of Measured Data	<b>Mohamed Elouazkiti</b> Proximate nutritive values, antioxidant capacity and antimicrobial properties of <i>Opuntia dillenii</i> cladodes.	<b>Abdelmouiz Ech-Charef</b> Environmental Impact Assessment of the Zaïda Abandoned Mine in Upper Moulouya, Morocco	<b>A.El jaouhari</b> Strategies for Improving Oxygen Evolution Reaction Electrocatalysis
<b>18h-18h15</b>	<b>Doha HALOUI</b> Industry 5.0 enabling technologies and potential applications in Smart agriculture.	<b>A.Sellam</b> Isolation and safety aspect of <i>Lactobacillus reuteri</i> strains with antimicrobial properties as potential probiotics for human use	<b>H. Atlas</b> Low cost biosorbent for the removal of a cationic dye from wastewater: Isotherm, kinetic studies & mechanism <b>analysis</b>	<b>Akram Laila</b> Raman and EPR studies of concrete behavior at high temperatures

### Day 1 - Poster sessions

Session 1	Session 2	Session 3	Session 4
Chairmen : • Prs : Mohammed SEBBANE • Ali OUBELKACEM • Younes BENGHOURIA	Chairmen : • Lhoussain HAJJI • Youness ZEGZOUTI FILALI • Lahcen HSSAINI	Chairmen : • Mohamed DOUMA • Najib TIJANI • Abdellah EL HMAÏDI	Chairmen : • Mohamed EL AMRAOUI • Aumeur EL AMRANI • Lahcen BEJJIT • Youness ACHAOU
<b>Abdellah BEN YAHIA</b> Prediction of relative humidity levels using Multi-layer Perceptron with Levenberg-Marquardt training algorithm	<b>Omayma Bouzekri</b> Antimicrobial Potential of Endemic Essential Oils Against fire blight: A Multifaceted In Vitro and In Silico Approach	<b>Rachid Et tanteny</b> Characterization , isotherms and kinetics adsorption for the removal of Anionic dye from an aqueous solution by biochar-modified bentonite	<b>Youssef Chahet</b> Determination of the parameters of an old polycrystalline photovoltaic panel using a single diode model - A comparative study of fitting methods
<b>Hafsa EL-IDRISSI</b> Computational and QSAR studies on pyrazole derivatives as corrosion inhibitors for mild steel in 1M HCl	<b>Youssef Haddadi</b> Cadmium Accumulation in Urban Sparrows ( <i>Passer domesticus</i> ): Assessing the Impact of High-Traffic Industrial Areas in Meknes Morocco	<b>Smail Imame</b> New abundant and economical waste solid for the dyes recovery in wastewater: optimization of treatment conditions	<b>Abdelmalek Mimouni</b> IoT based Monitoring and Data Analysis of a Non-ideal DC-DC Boost Converter for Smart Photovoltaic Systems
<b>Sohaib CHENGAOU</b> Intelligent transportation systems (ITS) and their impact on the agricultural sector	<b>Ilham Aanouz</b> Determination of essential oils Artemisia Herba - Alba phytochemical compounds and antibacterial activity investigation by in-silico and in vitro methods	<b>Hind Ragragui</b> Desertification Sensitivity Analysis Using the MEDALUS Model and GIS: A Case Study of the Jaaba Forest (Middle Atlas, Morocco)	<b>Yahya Mardoude</b> Enhancing Wind Power Efficiency: Exploring Innovative MPPT Techniques - ANN and ACO

# Program of **EnvIMEKO'10**

## SMART AGRICULTURE FOR WELL-BEING

### Day 1 - Poster sessions

<p><b>Hamid HAMDAROUY</b>                      Modèle d'apprentissage profond basé sur la sélection de caractéristiques et l'optimisation Adam pour prédire le rayonnement solaire global quotidien</p>	<p><b>EL MERNISSI RAFIK</b>                      Comparative Study of Phenolic Contents, Antioxidant Power, Anti-Inflammatory, and Analgesic Activities of Three Varieties of Cannabis Sativa L Seeds from Taounate</p>	<p><b>Habiba Ousmana</b>                      Surveillance et prédiction de la sécheresse à l'aide des indices dérivés de la Télédétection, indice météorologique et Plate-forme QGIS : étude de cas de la plaine de Tigriga (région d'Azrou, Moyen Atlas, Maroc)</p>	<p><b>Mouhssine Elbathoui</b>                      Complementary Split Ring Resonator Circular (CSRRs) are used in the design and simulation of a broadband bandpass filter</p>
<p><b>Abdelali KHRABCHA</b>                      Prediction of landslide susceptibility using GIS and Machine Learning Algorithms: case of the Ourika watershed (High Atlas of Marrakech, Morocco)</p>	<p><b>Hassane Boudad</b>                      Impacts des conditions thermiques sur les propriétés physiologiques des cultivars de pommiers cultivés au Maroc : comparaison dans deux sites contrastés</p>	<p><b>Nadia Handaq</b>                      Incidence environmental of the use of wastewater for irrigation of urban and peri-urban agriculture in Meknes city (Morocco)</p>	
	<p><b>Claude Ahouangninou</b>                      Assessment of Lead and Cadmium Contamination levels in Cotonou's Vegetable Growing Area</p>	<p><b>Soukaina NHARI</b>                      Leak detection and location system in water pipes</p>	
	<p><b>Sara Najjari</b>                      Agroforestry almond orchards for fava bean production under a mediterranean climate in the Saiss region</p>	<p><b>Abdellah Kaiba</b>                      Solar-Driven Synthesis of Methylammonium Tin(II) Chloride on Titanium Dioxide Nanoparticles for Immobilized Photocatalytic Water Decontamination</p>	
	<p><b>Rania Moubachir</b>                      Phytochemical Analysis and Biological Properties of Salicornia europaea L.: A Halophyte Species from Moulay-Bousselham Region</p>	<p><b>O. Taoussi</b>                      Crossing of UV-Visible absorption, 3D Fluorescence and PARAFAC chemometrics for the analysis of wastewater effluents treated by natural lagooning</p>	
	<p><b>Aziz Zouhri</b>                      Evaluation of antioxidant and anti-inflammatory activity of the aqueous extract of Cistus albidus leaves.</p>	<p><b>Mouhsine Hadine</b>                      Photochemical pollution mapping of the city of Kénitra using deterministic and geostatistical approaches</p>	

# Program of **EnvIMEKO'10**

## SMART AGRICULTURE FOR WELL-BEING

### Day 1 - Poster sessions

	<p><b>Karim Houmanat</b>                      Genetic diversity within Moroccan and introduced varieties of rapeseed (<i>Brassica napus</i> L.) revealed by ISSR markers</p>	<p><b>Osama A. Hussein</b>                      Enhancing Photocatalytic Activity of Oxygen Vacancies-Rich Tungsten Trioxide (WO<sub>3</sub>) for Sustainable Energy Conversion and Water Purification</p>	
	<p><b>M'hamdi Zakya</b>                      Antioxidant and insecticidal activities of ethanolic and aqueous extracts of <i>Urtica dioica</i> (L.).</p>	<p><b>Zahraa H. Al-Omaran</b>                      In Situ Thermal Reduction of TiO<sub>2</sub> nanoparticles for Enhanced Immobilized Water Purification under Sunlight Irradiation</p>	
	<p><b>Mostafa Ettarchouch</b>                      Evaluation de l'activité antioxydante des extraits aqueux et éthanolique de la plante <i>Tetraclinis articulata</i></p>	<p><b>Haya A. Al-Sunaidi</b>                      Improving Photocatalytic Efficiency of TiO<sub>2</sub> Films Incorporated with Natural Geopolymer for Sunlight-Driven Water Purification</p>	
	<p><b>Nouha Haoudi</b>                      Mohammed Kara, Hicham Aboumadane, Jamila Bahhou, Lahcen Hssaini, Razouk Rachid</p>	<p><b>Afafe ELABBADI</b>                      Synthesis and evaluation of the anticorrosion activity of a quinoxaline derivative for mild steel in HCl 1 M</p>	
	<p><b>Laila Sabrate</b>                      Mapping of leased hunting lots in Morocco: A preliminary step for studying the landscape effect on the selection of nesting sites by the Barbary partridge (<i>Alectoris barbara</i>).</p>	<p><b>Abderrahym GHOULDAN</b>                      Spatio-temporal evolution of forest areas: Case of the Maamora forest (North-West of Morocco)</p>	



# Program of EnvIMEKO'10

## SMART AGRICULTURE FOR WELL-BEING

### Day 2 - Communication sessions

	Session 2	Session 3	Session 4
	<p>Chairmen :</p> <ul style="list-style-type: none"> <li>Lhoussain HAJJI</li> <li>Youness ZEGZOUTI</li> <li>FILALI Lahcen HSSAINI</li> </ul>	<p>Chairmen :</p> <ul style="list-style-type: none"> <li>Mohamed DOUMA</li> <li>Najib TIJANI</li> <li>Abdellah EL HMAÏDI</li> </ul>	<p>Chairmen :</p> <ul style="list-style-type: none"> <li>Mohamed EL AMRAOUI</li> <li>Aumeur EL AMRANI</li> <li>Lahcen BEJJIT</li> <li>Youness ACHAOU</li> </ul>
11h30-11h45	<p><b>Mbambu K.</b> Yakam Matrix at the Interface between Agriculture-Climate Science-Research and Congolese Local Knowledge: ASEAD Experiences on Intelligent Reforestation of Acacia auriculaeformis and Orchards.</p>	<p><b>Abderrahmane YAAKOUBI</b> Land Spreading of Olive Mill Wastewater (OMW): Biodegradation of Organic Matter and Polyphenols in Soil and Effect on the Activity of the Total Soil Microflora</p>	<p><b>Imane Fikri</b> Characterization of wall-paintings fragments from the Roman sites Banasa and Volubilis in Morocco</p>
11h45-12h	<p><b>Mohamed Chtouki</b> Delineation of chickpea drip fertigation management zones using precision agricultural techniques under semi-arid conditions of Morocco</p>	<p><b>Chaimae NESSAH</b> Distribution of soil nitrate concentrations in a potato field in the Saiss basin</p>	<p><b>Nouhaila Oulida</b> Non-destructive Analysis of the Mortars from the Sijilmasa Mosque's Walls</p>
12h-12h15	<p><b>Hicham Zitoun</b> Apple Scab (<i>Ventura inaequalis</i>): Integrated Pest Management Methods in Orchards</p>	<p><b>Abdellah Oumou</b> Satellite-based evapotranspiration modeling in an agricultural region impacted by climate change using MODIS and the METRIC model: A case study of the Saiss basin, Morocco.</p>	<p><b>Bensalem El Jeddoui</b> Chiadma carpet of the Dar Si Said Museum in Marrakech: Dyes multi-technical analysis</p>
12h15-12h30	<p><b>Riffi Ouassima</b> Chemical composition and insecticidal activity of <i>Dysphania ambrosioides</i> (L.) against <i>Sitophilus Oryzae</i> L : Experimental and theoretical study</p>		
12h30-12h45	<p><b>Nouha Haoudi</b> Assessment of some structural and functional leaf traits in fig accession under water stress</p>		
12h45-13h	<p><b>M.Skiker</b> Enhancing Crop Resilience to Salinity Stress for Sustainable Agriculture of <i>Vicia Faba</i> L</p>		