

Faculté/Institut : des Sciences de le Technologies

Département : Electrotechnique

1- Identification du laboratoire/Unité de recherche			
		مخبر الإلكتروني تقني لقسنطينة	
		اسم المخبر	
Intitulé du Laboratoire	Laboratoire d'électrotechnique de constantine		
Acronyme du labo	LEC		
Adresse électronique			
Site web ou URL	http://lec-umc.org		
Année d'Agrément :	2000	Tel : 031819013	Fax : 031819013

2- Directeur du laboratoire/Unité de recherche			
Nom & Prénom	KHEZZAR Abdelmalek	Grade : Prof.	
Adresse Electronique	Abdelmalek.khezzar@lec-umc.org		
Nombre Equipes :	04	Nbre Chercheurs : 54	Nbre Personnel soutien : 01

3- Présentation du laboratoire
Thèmes mis en œuvres : <i>Electronique de puissance, qualité de l'énergie électrique, énergie renouvelable, production décentralisé, systèmes à induction, modélisation et commandes des entrainements électriques, diagnostic.</i>
Mots-Clés :

4- Chefs d'équipes		
.Titre de l'Equipe1	Equipe 1 : Electronique de puissance et Qualité de l'énergie électrique	
Nom - Chef d'équipe ¹	BENALLA Hocine	Grade : Prof.
.Titre de l'Equipe2	Production décentralisée et les énergies renouvelables	
Nom - Chef d'équipe ²	BOUZID Aissa	Grade : Prof
.Titre de l'Equipe3	Modélisation et Optimisation Systèmes à Induction Electromagnétique	
Nom - Chef d'équipe ³	LATRECHE Mohamed El Hadi	Grade : Prof
.Titre de l'Equipe4	Modélisation, contrôle et diagnostic des entrainements électriques	
Nom - Chef d'équipe ⁴	KHEZZAR Abdelmalek	Grade : Prof.

5- Liste des publications :
2009-2011
[1] F. Mehazzem, A. Reama, H. Benalla, "Sensorless Nonlinear Adaptative Backstepping Control of induction Motor", International Journal on Automatic Control and System Engineering, Issue III, Volume 8, Janvier 2009 ISSN Print 1687-4811, Online 1687-482X,
[2] Salima Meziane, Riad Toufouti, Hocine Benalla, "New Direct Torque Neuro_Fuzzy Control Based SVM for Dual Two Level Inverter-Fed Induction Motor", CEAI, Vol.11, N 2, pp 3-13, 2009,
[3] Riad Toufouti, Salima Meziane, Hocine Benalla, "New Direct Torque Neuro_Hybrid Neuro-Fuzzy Control For Induction Motor Using Space Vector Modulation", International Review of automatic Control (I. RE.CO), Vol 2. N4 July 2009.
[4] K. Nabti. K. Abed. H. Benalla, "Improved DTC relying on Hybrid Fuzzy-self tuning PI Regulator for the

- Permanent Magnet Synchronous Machine”, International Journal on Automatic Control and System Engineering, Issue III, Volume 8, Janvier 2009
- [5] K. Nabti, K. Abed, H. Benalla, “Speed-Sensorless Direct Torque Control of Permanent Magnet Synchronous Motors Improved By Fuzzy-PI Regulation”, International Journal Of electrical Engineering, Volume 2009 Issue 1.
 - [6] D. Labed, M. Bouchahdane, M. Zellagui and A. Bouzid “Dialogue between two numerical distance protections ABB and Siemens for the dispersed groups of productions connected in HVB network” World Journal of Engineering Issue Vol.6 No. 3 2009.
 - [7] S. Zerguini, B. Maouche, M. Latreche, and M. Feliachi, “A coupled fictitious electric circuit’s method for impedance of a sensor with ferromagnetic core calculation. Application to eddy currents non destructive testing”, Eur. Phys. J. Appl. Phys. 48, 31202 (2009) ISSN 1286-0042.
 - [8] H. ALLAG, J.P. YONNET, “3D Analytical Calculation of the Torque and Forces Exerted Between Two Cuboidal Magnets”, IEEE Transactions on Magnetics, Vol 45, NO 10, October 2009, ISSN: 0018-9464.
 - [9] Lebaroud. A , Clerc. G, “Accurate Diagnosis of Induction Machine Faults Using Optimal Time-Frequency Representations”, ELSEVIER, Engineering Applications of Artificial Intelligence, N° 22, pp 825–832, 2009.
 - [10] Ghoggal, S.E. Zouzou, H. Razik, M. Sahraoui, A. Khezzar, “An improved model of induction motors for diagnosis purposes – Slot skewing effect and air-gap eccentricity faults, Energy Conversion and Management, N° 50, pp. 1336–1347, 2009.
 - [11] Khezzar, A.; Kaikaa, M. Y.; Oumaamar, M. E. K.; Boucherma, M.; Razik, H.; “On the Use of Slot Harmonics as a Potential Indicator of Rotor Bar Breakage in the Induction Machine”, Industrial Electronics, IEEE Transactions on, Volume 56, Issue 11, Nov. 2009 Page(s):4592 – 4605, ISSN: 0278-0046.
 - [12] Khezzar, A.; Oumaamar, M. E. K.; Hadjami, M.; Boucherma, M.; Razik, H.; “Induction Motor Diagnosis Using Line Neutral Voltage Signatures”, Industrial Electronics, IEEE Transactions on, Volume 56, Issue 11, Nov. 2009 Page(s):4581 – 4591, ISSN: 0278-0046.
 - [13] Bentounsi, H. Djeghloud, H. Benalla, T. Birem and H. Amiar, “ Computer-Aided Teaching Using MATLAB/Simulink for Enhancing an IM Course with Laboratory Tests”, IEEE-TE, 2010, Vol. 53, Issue 4.
 - [14] Bentounsi, R. Rebbah, F. Rebahi, H. Djeghloud, H. Benalla, “Effects of the geometric parameters on performance of a SRM by numerical-analytical approach”, Studies in Computational Intelligence, Springer Verlag, Berlin, ISSN 1860-949X, ISBN 978-3-642-16224-4, 2010, Vol. 327, pp. 342-349.
 - [15] R. Rebbah, A. Bentounsi and H. Benalla, “New Approach for Optimizing Control of Switched Reluctance Generator”, International Journal of Computer and Electrical Engineering, ISSN 1793-8198, Vol. 2, N°2, 2010, pp. 365-370.
 - [16] Toufouti Riad, Benalla Hocine, and Meziane Salima, "New Direct Torque Neuro-Fuzzy Control Based SVM-Three Level Inverter-Fed Induction Motor. International Journal of Control, Automation, and Systems (2010) 8(2):425-432.
 - [17] M.S. Merzoug, H. Benalla, "Nonlinear Backstepping Control of Permanent Magnet Synchronous Motor (PMSM). International Journal of Systems Control (Vol.1-2010/Iss.1) pp. 30-34
 - [18] H. Djeghloud, A. Bentounsi and H. Benalla, “ Sub and Super-Synchronous Wind Turbine-Doubly Fed Induction Generator System Implemented as an Active Power Filter”, Int. Journal of Power Electronics, IJPELEC, ISSN 1756-6398, Inderscience Publishers, 2010.
 - [19] M. S. Merzoug and H. Benalla, "Sliding Mode Control of Permanent Magnet Synchronous Motor with a Space Vector Modulation. International Review on Modelling and Simulations IREMOS February 2010
 - [20] S. Amrane, M.E.H. Latreche, M. Feliachi, “Coupled Circuits Model Combined with Deterministic and Stochastic Algorithms for the Inductor Design”, Intern. Journal of Applied Electromagnetics and Mechanics, n°32, 2010; pp 195-206
 - [21] Medoued Ammar, Lebaroud Abdesslem, Ahcene Boukadoum and Guy Clerc, "On-line Faults Signature Monitoring Tool for, Induction Motor Diagnosis “, Journal of Electrical Engineering & Technology Vol. 5, No. 1, pp. 140~145, 2010.
 - [22] A.L. Nemmour, F. Mehazzem, A. Khezzar, M. Hacil, L. Louze, R. Abdessemed " Advanced Backstepping controller for induction generator using multi-scalar machine model for wind power purposes", Renewable Energy an international journal, Elsevier, Vol. 35, Issue 10, Oct.
 - [23] M. Hacil, A. Khezzar, L. Louze, A. L. Nemmour, "Harmonic Filtering and Power Generation using a Synchronous Machine for Wind Power Applications", Journal of Electrical Engineering, Vol. 10, 2010.
 - [24] Bentounsi, A.; Djeghloud, H.; Benalla, H.; Birem, T.; Amiar, H.; “Computer-Aided Teaching Using MATLAB/Simulink for Enhancing an IM Course With Laboratory Tests” Education, IEEE Transactions on, Vol. :

54 Issue:3 , pp : 479 - 491.

- [25] Messaoud Makhoulouf, Feyrouz Messai, Hocine Benalla, Vectorial Command Of Induction Motor Pumping System Supplied By A Photovoltaic Generator, *Journal of Electrical Engineering*, Vol. 62, No. 1, 2011, 3–10.
- [26] Lebaroud Abdesselam and Clerc Guy, Study of Rotor Asymmetry Effects of an Induction Machine by Finite Element Method, *Journal of electrical engineering & technology* Volume 6, Issue 3, May 2011, pp 342-349.
- [27] H. ALLAG, J. P. YONNET and M. E. H. LATRECHE, "Analytical calculation of the torque exerted between two perpendicularly magnetized magnets", *Journal of applied physics* 109. 07E701, 2011.
- [28] P. YONNET, H. ALLAG, J. 3D Analytical calculation of permanent magnet Interaction by magnet node presentation, *IEEE Transaction on Magnetics*, Vol 47, NO 8, August 2011.
- [29] S. Meziane, R. Toufouti, H. Benalla "Etude Comparative entre la DTC Deux niveaux et la DTC Trois Niveaux de la Machine Asynchrone". *Communication Science & Technologie* N°7 Janvier 2009.
- [30] S. Belekhal, H. Benalla , A. Bentounsi, Power maximization control of small wind system using permanent magnet synchronous generator, *Revue des Energies Renouvelables* Volume 12 Numéro 2 Juin 2009.
- [31] M. Hacil, A. Khezzar, A. L. Nemmour, L. Louze, Harmonic current cancellation and control of grid-connected synchronous generator entrained by wind turbine, *Revue des Energies Renouvelables* Volume 12 Numéro 3 September 2009.
- [32] R. Rebbah, A. Bentounsi, H. Benalla et H. Djeghloud, « Optimisation de la commande d'une GRV pour une application éolienne », *Revue des Energies Renouvelables*, Vol. 13, N°3, Sept. 2010, pp. 407-420.
- [33] S. Belakehal, A. Bentounsi, M. Merzoug et H. Benalla « Modélisation et commande d'une génératrice à aimants permanents dédiée à la conversion de l'énergie éolienne », *Revue des Energies Renouvelables*, Vol. 13, N°1, Mars 2010, pp. 149-161.
- [34] R. Khezzar, M. Zereg et A. khezzar, "Comparaison entre les différents modèles électriques et détermination des paramètres de la caractéristique I-V d'un module photovoltaïque" *Revue des Energies Renouvelables* Vol. 13 N°3 (2010) 379 – 388
- [35] Halim Chennoufi, L. Lamri, Ahmed Lokmane Nemmour et Abdelmalek Khezzar, "Contrôle d'une génératrice synchrone à aimants permanents dédiée à la conversion de l'énergie éolienne par la commande directe du couple", *Revue des Energies Renouvelables SMEE'10 Bou Ismail Tipaza* (2010) 115 – 124
- [36] KENDOULI F. ; NABTI K. ; LABED K. ; BENALLA H. , "Modélisation, simulation et contrôle d'une turbine éolienne à vitesse variable basée sur la génératrice asynchrone à double alimentation" *Revue des Energies Renouvelables*, Vol. 14 N°1,
- [37] M.S. Merzoug, H. Benalla and L. Louze, Nonlinear control of permanent magnet synchronous
- [38] generators (PMSG) using feedback linearization, *Revue des Energies Renouvelables* Vol. 14 N°2 (2011) 357 – 367
- [39] M. Belatel et al. « Technologie du couplage d'un système hybride de type photovoltaïque-éolien avec la pile à combustible pour la production de l'électricité verte », *Revue des Energies Renouvelables* Vol. 14 N°1 (2011) 145 – 162.
- [40] M. Belatel and H. Benalla, "Computer aided design of IM using FE coupled to circuit equations", *COST, ENSET, Oran*, N° 7, Janvier 2009, article 135.

2012-2015

- [1] M. Amarouayache, A. Bouzid, and S. Bouchakour, "Une nouvelle stratégie pour la poursuite du point optimal de fonctionnement dans un système photovoltaïque," *revue des énergies renouvelables*, vol. 15, no. 2, pp. 297–304, 2012.
- [2] A. Boulahia, K. Nabti, and H. Benalla, "Direct Power Control for Three-level NPC Based PWM AC/DC/AC Converter in Doubly Fed Induction Generators Based Wind Turbine," *International Journal of Electrical and Computer Engineering (IJECE)*, vol. 2, no. 3, pp. 425–436, Apr. 2012.
- [3] M. S. Djebbar and H. Benalla, "Study of Voltage Stability Continuous Multilevel Inverter Voltage Applied to the Induction Machine," *International Journal of Environmental Science and Development*, pp. 268–273, 2012.
- [4] F. Kendouli, K. Abed, K. Nabti, and H. Benalla, "Modelling and control of a variable speed wind turbine driving doubly fed induction generator using three-level PWM converter," *International Journal of Renewable Energy Technology*, vol. 3, no. 3, pp. 276–294, Jan. 2012.
- [5] M. S. Merzoug, H. Benalla, and L. Louze, "Clean Energy Solutions for Sustainable Environment (CESSE) Sliding

- Mode Control (SMC) Of Permanent Magnet Synchronous Generators (PMSG)," *Energy Procedia*, vol. 18, pp. 43–52, Jan. 2012.
- [6] F. Messai, M. Makhlouf, and H. Benalla, "NONLINEAR 8/6 SWITCHED RELUCTANCE GENERATOR EXCITED BY PARTICULAR CONVERTER.," *Journal of Theoretical & Applied Information Technology*, vol. 45, no. 1, pp. 33–37, Nov. 2012.
- [7] S. Meziane, R. Toufouti, A. Merabet, and H. Benalla, "Cascaded Nonlinear Adaptive Predictive Control based Adaptive Flux Observer of Induction Motor," *International Journal of Computer Applications*, vol. 56, no. 4, pp. 37–43, Oct. 2012.
- [8] S. Mouellef, A. Bentounsi, and H. Benalla, "Teeth Shape Design of a Switched Reluctance Motor for High Torque Using Genetic Algorithms," *International Journal of Scientific & Engineering Research*, vol. 3, no. 10, pp. 1128–1132, Oct. 2012.
- [9] F. Babaa, A. Khezzar, and M. el kamel Oumaamar, "Experimental investigation and comparative study of interturn short-circuits and unbalanced voltage supply in induction machines," *Front. Energy*, vol. 7, no. 3, pp. 271–278, Sep. 2013.
- [10] H. R. E. H. Boucekara, M. K. Smail, and G. Dahman, "Diagnosis of Multi-Fault Wiring Network Using Time-Domain Reflectometry and Electromagnetism-Like Mechanism," *Electromagnetics*, vol. 33, no. 2, pp. 131–143, Feb. 2013.
- [11] H. Boucekara, "Electromagnetic Device Optimization Based on Electromagnetism-Like Mechanism.," *Applied Computational Electromagnetics Society Journal*, vol. 28, no. 3, pp. 241–248, 2013.
- [12] H. R. E. H. Boucekara, "Optimal design of electromagnetic devices using a black-hole-based optimization technique," *IEEE Transactions on Magnetics*, vol. 49, no. 12, pp. 5709–5714, Dec. 2013.
- [13] A. Boulahia, M. Adel, and H. Benalla, "Predictive Power Control of Grid and Rotor Side converters in Doubly Fed Induction Generators Based Wind Turbine," *Bulletin of Electrical Engineering and Informatics*, vol. 2, no. 4, pp. 258–264, Dec. 2013.
- [14] R. Delimi and M. H. Latreche, "Resolution of Inverse Problems for Electromagnetic Levitated and Guided Systems using the Finite Element Method and the Genetic Algorithms," *International Journal of Computer Applications*, vol. 76, no. 7, pp. 30–34, Aug. 2013.
- [15] A. Mehdi, H. Medouce, S. eddine Rezgui, A. Boulahia, F. Mehazzem, and H. Benalla, "PWM Converters and its Application to the Wind-energy Generation," *Energy Procedia*, vol. 42, pp. 523–529, 2013.
- [16] F. Messai, M. Makhlouf, A. Messai, K. Nabti, and H. Benalla, "Nonlinear Modeling and Simulation of a Four-phase Switched Reluctance Generator for Wind Energy Applications," *Journal of Clean Energy Technologies*, vol. 1, no. 2, 2013.
- [17] S. E. Rezgui and H. Benalla, "New Robust and Mechanical Sensorless Scheme for SVM Inverter Fed Induction Motor Drive Using Variable Structure Controllers and MRAS," *Arab J Sci Eng*, vol. 38, no. 6, pp. 1449–1458, Jun. 2013.
- [18] H. R. E. H. Boucekara, M. A. Abido, and M. Boucherma, "Optimal power flow using Teaching-Learning-Based Optimization technique," *Electric Power Systems Research*, vol. 114, pp. 49–59, Sep. 2014.
- [19] H. R. E. H. Boucekara, A. Kedous-Lebouc, J. P. Yonnet, and C. Chillet, "Multiobjective optimization of AMR systems," *International Journal of Refrigeration*, vol. 37, pp. 63–71, Jan. 2014.
- [20] H. R. E. H. Boucekara, M. Nahas, and M. T. Simsim, "Performance Analysis and Parametric Study of an Active Magnetic Regenerator Based on the Design of Experiments Approach," *Arab J Sci Eng*, vol. 39, no. 4, pp. 3147–3159, Apr. 2014.
- [21] H. R. E. H. Boucekara, "Optimal power flow using black-hole-based optimization approach," *Applied Soft Computing*, vol. 24, pp. 879–888, Nov. 2014.
- [22] M. Y. Kaikaa, M. Hadjami, and A. Khezzar, "Corrections to Effects of the Simultaneous Presence of Static Eccentricity and Broken Rotor Bars on the Stator Current of Induction Machine," [May 14 2452-2463]," *IEEE Transactions on Industrial Electronics*, vol. 61, no. 6, pp. 2942–2942, Jun. 2014.
- [23] M. Y. Kaikaa, M. Hadjami, and A. Khezzar, "Effects of the simultaneous presence of static eccentricity and broken rotor bars on the stator current of induction machine," *IEEE Transactions on Industrial Electronics*, vol. 61, no. 5, pp. 2452–2463, mai 2014.
- [24] M. Y. Kaikaa, M. Hadjami, and A. Khezzar, "Effects of the simultaneous presence of static eccentricity and broken rotor bars on the stator current of induction machine," *IEEE Transactions on Industrial Electronics*, vol. 61, no. 5, pp. 2452–2463, mai 2014.
- [25] R. Khezzar, M. Zereg, and A. Khezzar, "Modeling improvement of the four parameter model for photovoltaic modules," *Solar Energy*, vol. 110, pp. 452–462, Dec. 2014.

- [26] Y. Maouche, M. E. K. Oumaamar, M. Boucherma, and A. Khezzar, "A New Approach for Broken Bar Fault Detection in Three-Phase Induction Motor Using Instantaneous Power Monitoring under Low Slip Range," *International Journal of Electrical and Computer Engineering (IJECE)*, vol. 4, no. 1, pp. 52–63, 2014.
- [27] Y. Maouche, M. E. K. Oumaamar, M. Boucherma, and A. Khezzar, "Instantaneous power spectrum analysis for broken bar fault detection in inverter-fed six-phase squirrel cage induction motor," *International Journal of Electrical Power & Energy Systems*, vol. 62, pp. 110–117, Nov. 2014.
- [28] A. Mehdi, S. Rezgui, H. Medouce, and H. Benalla, "A Comparative Study between DPC and DPC-SVM Controllers Using dSPACE (DS1104)," *International Journal of Electrical and Computer Engineering (IJECE)*, vol. 4, no. 3, pp. 322–328, Jun. 2014.
- [29] F. Messai, M. Makhlof, H. Benalla, and A. Messai, "Double salient switched reluctance generator for wind energy application," *Revue des Energies Renouvelables*, vol. 17, no. 1, pp. 71–82, 2014.
- [30] M. A. M. Ramli, A. Hiendro, and H. R. E. H. Boucekara, "Performance Analysis of Hybrid PV/Diesel Energy System in Western Region of Saudi Arabia," *International Journal of Photoenergy*, vol. 2014, p. e626251, May 2014.
- [31] M. K. Smail, H. R. E. H. Boucekara, L. Pichon, H. Boudjefdjouf, and R. Mehasni, "Diagnosis of wiring networks using Particle Swarm Optimization and Genetic Algorithms," *Computers & Electrical Engineering*, vol. 40, no. 7, pp. 2236–2245, Oct. 2014.
- [32] H. Boudjefdjouf, R. Mehasni, A. Orlandi, H. R. E. H. Boucekara, F. de Paulis, and M. K. Smail, "Diagnosis of Multiple Wiring Faults Using Time-Domain Reflectometry and Teaching–Learning-Based Optimization," *Electromagnetics*, vol. 35, no. 1, pp. 10–24, Jan. 2015.
- [33] A. Boussaid, A. L. Nemmour, L. Louze, and A. Khezzar, "A novel strategy for shunt active filter control," *Electric Power Systems Research*, vol. 123, pp. 154–163, juin 2015.
- [34] M. S. Djebbar and H. Benalla, "High Performances of an Active Filter Compared to a Passive Filter: Improvement of the Electric Power Quality," *International Journal of Engineering and Technology (IJET)*, vol. 7, no. 5, pp. 1873–1891, Nov. 2015.
- [35] N. Hamouda, K. E. Hemsas, H. Benalla, and A. Boutaghane, "An advanced control approach for current harmonic cancellation using shunt active power filter," *International Journal of Industrial Electronics and Drives*, vol. 2, no. 1, pp. 35–42, Jan. 2015.