



Michel El Hayek

Professor

O: E30.14

T: 09.218950, Ext. 2027

E: mhayek@ndu.edu.lb

Biography

Dr. El Hayek joined Notre Dame University-Louaize as Assistant Professor in the Department of Mechanical Engineering in 1998 and is currently a Professor of Mechanical Engineering in the same department. He chaired the Department of Mechanical Engineering from 2006 to 2012, and is currently the Dean of the Faculty of Engineering since 2012.

Dr. El Hayek is regularly teaching courses in the areas of fluid mechanics, heat transfer, thermodynamics, computational methods, fluid power technology, etc. He is conducting research in his areas of expertise and contributing to scholarly activities at both local and international scales as reviewer, committee member and organizer of international conferences, etc..

Dr. El Hayek is member of ASHRAE and is currently the Regional Vice-Chair for Student Activities of the ASHRAE Region-At-Large covering the Middle East, Africa and the Indian Sub-Continent. He was the President of the Lebanese ASHRAE Chapter between 2012 and 2014. He is also member of ASEE and the Order of Engineers and Architects, Tripoli.

Peer-reviewed Journals

International

- M. HAYEK, J. ASSAF, & W. LTEIF: Experimental Investigation of the Performance of Evacuated-Tube Solar Collectors under Eastern Mediterranean Climatic Conditions, *Energy Procedia (Elsevier)*, Vol.6, pp.618-626, 2011.
- M. EL HAYEK: Prediction of Turbulent Thermal Boundary Layers Using Scalar Turbulence Modeling Techniques, *WSEAS Transactions on Heat and Mass Transfer*, Vol.2, pp. 28-35, 2007.
- M. EL HAYEK, A HAMMOUD: Numerical versus Experimental and Analytical Predictions of Liquid Jet Pump Overall Performance, *WSEAS Transactions of Fluid Mechanics*, 1, pp. 399-406, 2006.
- M. EL HAYEK, J. HENRIETTE, Th. VAN DER MEER: Effects of time scale ratio in turbulent diffusion flames modelling, *European Journal of Mechanical and Environmental Engineering*, 41, pp.3-10, 1996.
- F.TANCREZ, J.-M. DETRY, C. DUMORTIER, M. EL HAYEK, P. LYBAERT, Y. RIQUIER: Modélisation de l'écoulement d'acier en panier répartiteur à la coulée continue, *ATB Métallurgie*, XXXIV/XXXV, pp.11-16, 1994/1995.
- M. EL HAYEK, J. HENRIETTE: Turbulent convective heat transfer predictions with two-equation scalar turbulence model, *ICChemE Symposium Series N°.129*, ICChemE & Hemisphere Publishing Corporation, London (UK), pp.955-961, 1992.

Peer-reviewed Conference Proceedings

Local

- M. EL HAYEK: Themofluid engineering education in the computer era, *Proceedings of Conference on the Use of Information Technology in Higher Education in Arab Universities*, pp.95-104, Notre Dame University Press (Lebanon), 2001.

Regional

- M. ZABLOUK, F. HANNA, M. HAYEK: Experimental investigation of direct-contact heat transfer in isopentane/water, Proceedings of the Sixth Jordan International Chemical Engineering Conference, pp. 254-261, 2012.
- M. EL HAYEK: Prediction of Heated Turbulent Jet Flow using Advanced Scalar Turbulence Models"; paper IMEC2004-3002 in the Proceedings of IMECE2004 "Recent Advances and Applications in Fluid Mechanics"; Part I, pp.15-32, Kuwait Society of Engineers, 2004.

International

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- S. MELKI, M. HAYEK: Building Simulation Tools and Their Role in Improving Existing Building Designs, Proceedings of ACTEA09, Notre Dame University, Lebanon, pp. 503-507, 2009.
- M. HAYEK: Investigation of Evacuated-Tube Solar Collectors Performance Using Computational Fluid Dynamic, Proceedings of ACTEA09, Notre Dame University, Lebanon, pp. 240-244, 2009.
- M. EL HAYEK: A New Scalar Reynolds Stress Model for Non-Isothermal Wall Bounded Turbulent Flows, Proceedings of the 5th WSEAS International Conference on Heat Transfer, Thermal Engineering, and Environment, pp.146-151, IASME/WSEAS 2007.
- M. EL HAYEK, A HAMMOUD: Prediction of Liquid Jet Pump Performance Using Computational Fluid Dynamics, Proceedings of the 4th WSEAS International Conference on Fluid Mechanics and Aerodynamics, pp. 148-153, IASME/WSEAS, 2006.
- M. EL HAYEK: Thermal Performance of Stone-Built Old Lebanese Houses as Revealed by Modern Advanced Numerical Methods, Proceedings of PLEA2005 "Environmental Sustainability: The Challenge of Awareness in Developing Countries"; Vol.2, pp.791-796, Notre Dame University (Lebanon), 2005.
- F. MEI, M. EL HAYEK, H. MEUNIER: The predictions of RNG-based turbulence models in complex flows under low Reynolds number conditions, Eurotherm Seminar N°53, 8-10 October 1997, Mons (Belgium).
- M. EL HAYEK, J. HENRIETTE: Elliptic predictions of heated turbulent jets using advanced turbulence closures, Eurotherm Seminar N°53, 8-10 October 1997, Mons (Belgium).
- J. HENRIETTE, M. EL HAYEK, M. ZAOUI: Simulation of premixed combustion in gaseous turbulent flow. Comparison of different algorithm, Proceedings of the workshop "New Concept in the Energy Sector"; Zakopane (Poland), 16-21 June 1997, R.A. Bialecki & Z. Rudnicki (ed.).
- M. ZAOUI, M. EL HAYEK, J. HENRIETTE: Simulation de la combustion en écoulements gazeux turbulent prémélangé : Comparaison d'algorithmes de traitement du couplage pression-vitesse, Proceedings of the 4th National Congress on Theoretical and Applied Mechanics, pp.59-62, 1997
- M. EL HAYEK, J. HENRIETTE: Turbulent convective heat transfer predictions using advanced Reynolds stress closures, Proceedings of the 4th National Congress on Theoretical and Applied Mechanics, pp.185-188, 1997
- M. ZAOUI, M. EL HAYEK, J. HENRIETTE: Comparaison des algorithmes PISO, SIMPLE, SIMPLER et SIMPLEC pour le traitement du couplage pression-vitesse dans des écoulements à masses volumiques variables, Rencontre SFT 96, 13-15 mai 1996, 6 pages.
- Kh. HENAINE, M. EL HAYEK, J. HENRIETTE: Utilisation de la méthode des transferts discrets dans un logiciel de calcul des transferts de chaleur combinés, Rencontre SFT 96, 13-15 mai 1996, 6 pages.
- M. EL HAYEK, Th. H. VAN DER MEER, J. HENRIETTE: Effects of Time Scale Ratio in Turbulent Diffusion Flames Modelling, Proceedings of the 3rd National Congress on Theoretical and Applied Mechanics, Liège (Belgium), 30-31 May 1994, pp.47-50.
- P. LYBAERT, M. EL HAYEK, H. MEUNIER: Modélisation des transferts thermiques couplés conduction-convection-rayonnement dans les fours discontinus de cuisson céramique, Rencontre SFT 93, Pau (France), 25-26 mai 1993, 8 pages.
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- P. LYBAERT, M. EL HAYEK, H. MEUNIER: Modelling of radiant heat transfer in charge stackings of ceramics firing kilns, Proceedings of EURO THERM Seminar Nr.21, Villeurbanne (France), 3-5 February 1992, pp.217-227.
- P. LYBAERT, M. EL HAYEK, H. MEUNIER: Modélisation des phénomènes de transfert de chaleur dans les fours de cuisson céramique - Application à l'amélioration de l'isothermie de la charge, Comptes-rendus du 3ème Congrès de Génie des Procédés, Compiègne (France), 4-6 septembre 1991, 2 pages.
- B. KHARBOUCH, P. LYBAERT, M. EL HAYEK, H. MEUNIER: Modélisation du transfert thermique convectif dans une cavité partiellement occupée par un milieu poreux - Simulation numérique, Comptes-rendus des 5èmes Journées Internationales de THermique (JITH.91), Monastir (Tunisie), 22-26 avril 1991, Tome I, pp.31-39.
- P. LYBAERT, B. KHARBOUCH, M. EL HAYEK, H. MEUNIER: Modelling and simulation of flue gas flow and heat transfer in charge stackings of ceramics firing kilns, Proceedings of the 2nd European Conference on Industrial Furnaces and Boilers (INFUB), Vilamoura (Portugal), 2-5 April 1991, Vol.II, 9 pages.
- P. LYBAERT, B. KHARBOUCH, M. EL HAYEK: Modélisation et simulation de l'écoulement des gaz brûlés et du transfert de chaleur au sein d'une charge de structure empilage dans les fours de cuisson céramique, Actes du colloque de thermique "Progrès et Défis Actuels"; Volume 2 (Articles spécialisés), Rencontre SFT 90, ISITEM,

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- H. MEUNIER, P. LYBAERT, M. CAMBIER, M. EL HAYEK: Simulation informatique des fours industriels. Application à la recherche des conditions optimales de fonctionnement, Actes des journées techniques "Maîtrise de l'Energie dans l'Industrie", MEI 90, Paris (France), 25 avril 1990, 11 pages.
- H. MEUNIER, P. LYBAERT, M. CAMBIER, M. EL HAYEK: Applications des simulateurs de fours à la recherche des conditions optimales de fonctionnement, Actes de la journée d'étude "Utilisation Optimale de l'Energie dans l'Industrie", SRBII/IBRA, Bruxelles (Belgique), 15 mars 1990, 16 pages.
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International

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- M. ZAOUI, M. EL HAYEK, J. HENRIETTE: Comparaison des algorithmes PISO, SIMPLE, SIMPLER et SIMPLEC pour le traitement du couplage pression-vitesse dans des écoulements à masses volumiques variables, Thermique et Transports, B.DESMET, B. BAUDOIN et S. LASSUE (ed.), Elsevier, Paris (France), pp.545-550, 1997.
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- P. LYBAERT, M. EL HAYEK, H. MEUNIER: Modélisation des transferts thermiques couplés conduction - convection - rayonnement dans les fours discontinus de cuisson céramique, La Thermique - Trait d'union entre les Sciences et les Technologies, R. CREFF et P. ANDRE (ed.), Editions Européennes Thermique et Industrie, Paris (France), pp.372-380, 1994.
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- P. LYBAERT, M. EL HAYEK, H. MEUNIER: Modelling of radiant heat transfer in charge stackings of ceramics firing kilns, Heat Transfer in Semi-Transparent Media, F. ALLARD, J.F. SACADURA et M. SPIGA (ed.), Editions Européennes Thermique et Industrie, Paris (France), pp.227-236, 1992.
- P. LYBAERT, M. EL HAYEK, H. MEUNIER: Numerical modelling of ceramics firing kilns - Application to the improvement of energy efficiency and product quality, Energy Efficiency in Process Technology - Abstracts, P.A. PILAVACHI (ed.), Commission of European Communities, pp.147-148, 1992.

Specialized Reports

Local

- M. EL HAYEK, S. RIBESSE, P. LYBAERT, H. MEUNIER: Développement d'un centre d'expertise dans le domaine de la modélisation et la simulation des fours industriels, Rapport scientifique 4-9/1997, Convention RW-FPMs n° 3186 - Visa 96/42701, 48 pages, décembre 1997.
- M. EL HAYEK, S. RIBESSE, P. LYBAERT, H. MEUNIER: Développement d'un centre d'expertise dans le domaine de la modélisation et la simulation des fours industriels, Rapport scientifique 10/96-3/97, Convention RW-FPMs n° 3186 - Visa 96/42701, 52 pages, Mars 1997.
- M. EL HAYEK, P. LYBAERT: Simulation de l'écoulement de l'acier dans un répartiteur de coulée continue, Rapport final, Contrat FPMs-Coeckerill-Sambre n° 9606/0704, 31 pages, décembre 1996.
- M. EL HAYEK, H. MEUNIER: Modélisation du rayonnement - Détermination du facteur d'absorption par une technique "somme des gaz gris", Rapport d'avancement, Convention RW-FPMs n° 3186 - Visa 96/42701, 4 pages, octobre 1996.
- M. EL HAYEK, F. FASILOW, E. TASSIGNON, P. LYBAERT, H. MEUNIER: Modélisation, amélioration du fonctionnement et de la conception des fours de fusion de verre et des fours de cuisson céramique, Rapport technique final, Convention Région Wallonne n°2563, 112 pages, février 1996.
- M. EL HAYEK, F. FASILOW, E. TASSIGNON, H. MEUNIER: Modélisation, amélioration du fonctionnement et

de la conception des fours de fusion de verre et des fours de cuisson céramique, Rapport d'activités N°4, RW-DGTR Contrat 94/30917, 19 pages, novembre 1995.

- M. EL HAYEK: Effects of time scales ratio in turbulent diffusion flames modelling, Internal Report, Delft University of Technology (The Netherlands), 15+iv pages, October 1993.
- M. EL HAYEK, J. HENRIETTE, P. LYBAERT: Modélisation des échanges thermiques par convection en régime turbulent, Rapport interne N°.TEC-R90/1, Faculté Polytechnique de Mons, 1991, 79 pages.
- M. EL HAYEK: Modélisation des échanges thermiques par convection forcée dans des conduits de section constante, Rapport interne N°.TEC-R88/3, Faculté Polytechnique de Mons, 1988, 35 pages.
- M. EL HAYEK, J. HENRIETTE, P. LYBAERT: Modélisation de la convection forcée laminaire dans des conduits de section constante, Rapport interne N°.TEC-R88/2, Faculté Polytechnique de Mons, 1988, 77 pages.

International

- M. EL HAYEK, P. LYBAERT, H. MEUNIER: EX-LIBRIS - Expert System for Energy Efficiency and Pollution Abatement in Industry, 4th Progress Report, CEE-JOULE, Contract JOE3-CT95-0040, 12 pages, January 1998.
- P. LYBAERT, M. EL HAYEK, H. MEUNIER: EX-LIBRIS - Expert System for Energy Efficiency and Pollution Abatement in Industry, 3rd Progress Report, CEE-JOULE, Contract JOE3-CT95-0040, 8 pages, June 1997.
- M. EL HAYEK, P. LYBAERT, H. MEUNIER: EX-LIBRIS - Expert System for Energy Efficiency and Pollution Abatement in Industry, 2nd Progress Report, CEE-JOULE, Contract JOE3-CT95-0040, 17 pages, December 1996.
- M. EL HAYEK, P. LYBAERT, H. MEUNIER: EX-LIBRIS - Expert System for Energy Efficiency and Pollution Abatement in Industry, Deliverable D1, CEE-JOULE, Contract JOE3-CT95-0040, 16 pages, October 1996.
- M. EL HAYEK, P. LYBAERT, H. MEUNIER: EX-LIBRIS - Expert System for Energy Efficiency and Pollution Abatement in Industry, 1st Progress Report, CEE-JOULE, Contract JOE3-CT95-0040, 13 pages, July 1996.
- P. LYBAERT, E. TASSIGNON, M. EL HAYEK, H. MEUNIER: Recommendations for a more energy efficient design of ceramic furnaces - Selection of a case study, Improvement of energy efficiency in glass-melting furnaces, cement kilns and baking ovens, Deliverable D23, CEE-JOULE, Contract JOU2-CT92-0107, 9 pages, April 1996.
- P. LYBAERT, E. TASSIGNON, M. EL HAYEK, H. MEUNIER: Control/operating improvements integrating model based knowledge of ceramic furnaces operating conditions - Selection of a case study, Improvement of energy efficiency in glass-melting furnaces, cement kilns and baking ovens, Deliverable D22, CEE-JOULE, Contract JOU2-CT92-0107, 7 pages, April 1996.
- P. LYBAERT, E. TASSIGNON, M. EL HAYEK, H. MEUNIER: Improvement of energy efficiency in glass-melting furnaces, cement kilns and baking ovens, Final Report, CEE-JOULE, Contract JOU2-CT92-0107, 50 pages, April 1996.
- P. LYBAERT, M. EL HAYEK, H. MEUNIER: Improvement of energy efficiency in glass-melting furnaces, cement kilns and baking ovens, Deliverable D10, CEE-JOULE, Contract JOU2-CT92-0107, 10 pages, April 1996.
- P. LYBAERT, M. EL HAYEK, E. TASSIGNON, H. MEUNIER: Model based knowledge for more efficient end environmentally acceptable batch and tunnel furnaces design and operating conditions, Improvement of energy efficiency in glass-melting furnaces, cement kilns and baking ovens, Deliverable D12, CEE-JOULE, Contract JOU2-CT92-0107, 8 pages, April 1996.
- P. LYBAERT, E. TASSIGNON, M. EL HAYEK, H. MEUNIER: Improvement of energy efficiency in glass-melting furnaces, cement kilns and baking ovens, 5th Progress Report, CEE-JOULE, Contract JOU2-CT92-0107, 18 pages, September 1995.
- P. LYBAERT, M. EL HAYEK, H. MEUNIER: Energy saving and pollution abatement in glass-making furnaces, cement kilns and baking ovens, Contribution au "Final Report", CEE-JOULE Contract JOUE-0051-C, December 1994, 64 pages.
- P. LYBAERT, M. EL HAYEK, H. MEUNIER: Energy saving and pollution abatement in glass-making furnaces, cement kilns and baking ovens, Contribution au "8th Progress Report", CEE-JOULE Contract JOUE-0051-C, June 1994, 11 pages.
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- H. MEUNIER, P. LYBAERT, M. EL HAYEK: Energy saving and pollution abatement in glass-making furnaces, cement kilns and baking ovens, Contribution au "1st Progress Report", CEE-JOULE Contract JOUE-0051-C, December 1990, 13 pages.

Esteemed indicators

- Regional Vice-Chair, ASHRAE Region-at-Large, 2016-
- Member of Student Activities Committee, ASHRAE, 2016-
- Chapter President, ASHRAE Lebanese Chapter, 2012-214
- Chapter President Elect, ASHRAE Lebanese Chapter, 2010-2012
- Chapter Student Activities Chair, Lebanese ASHRAE Chapter, 209-2016
- Delegate /Alternate, Lebanese ASHRAE Chapter, Various Chapter Regional Conferences (CRCs)
- Treasurer and Secretary of the Lebanese ASEE Branch, 2014-
- Editorial Board Member, Lebanese Science Journal, CNRS, 2017-
- Chair and/or member of all committees, International Conference on Advances in Computational Tools for Engineering Application (ACTEA) Series, Notre Dame University (Lebanon), 2009-.
- Honorary Co-Chair, International Conference on Renewable Energies for Developing Countries (REDEC) Series, Beirut (Lebanon), 2014-
- Organizing Committee, 9th World Congress on Engineering Education (2013) & 10th World Congress on Engineering Education (2015) organized by the Committee on Engineering Education of the World Federation of Engineering Organizations (WFEO), Beirut (Lebanon).
- Co-Chair and member of all committees of the International Conference on Advanced Research and Applications in Mechanical Engineering (ICARAME11), Notre Dame University (Lebanon), 13-15 June 2011.
- Invited Lecturer, Order of Engineers and Architects - Beirut (April 2015, Beirut, Lebanon), EcOrient Conference (2013, Beirut, Lebanon), etc.
- Reviewer, ASHRAE Annual Meetings & Conferences, Experimental Thermal and Fluid Sciences, etc.
- Thesis Supervisor / Committee Member, NDU, AUB, BAU, Uni. Angers, etc.
- Chapter Service Award, ASHRAE, 2015
- Macquet-Houzeau de Lehaie Prize, AIMs (Association des Ingénieurs de la Faculté Polytechnique de Mons), 1992.

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