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Editorial

Ce numéro 09 de la revue d'Oran2 est consacré entièrement aux communications retenues par le conseil scientifique du colloque international IEMS'22 The 1st International Symposium on Industrial Engineering Maintenance and Safety dont la thématique a porté sur : « du génie Industriel, l'électromécanique et la sécurité Industrielle » organisé sous l'égide du laboratoire « LISIDD » de l'institut mécanique de la sécurité égide (IMSI) de l'université d'Oran2, les 5 et 6 mars 2022. Ces communications sont au nombre de six (06) dont les thèmes et les auteurs se présentent ainsi

The first paper, “A Powerful Nonlinear Control Method Based on an Improved Adaptive Integral-Backstepping Technique for Optimal Speed Tracking of Induction Motors” was presented by Bilel AICHI (Group of Control, Laboratory of Electrical Drives Development LDEE, Department of Electrical Engineering, University of Science and Technology of Oran USTO-MB, Oran, Algeria. This paper describes an advanced control method of induction motors using an improved Integral-Backstepping version. The application of the conventional version of this technique has proven that it can cause bad behaviour during certain operating conditions because of its structure based on the integral action, which can cause strong vibrations accompanied by overcurrent before the final system stabilization. The adjustment presented in this work to improve the control and ensure its stability in the different operating zones is to incorporate the variable gains structure in the speed regulator. He concluded that All control signals are generated to achieve the asymptotic stability of the system based on the second Lyapunov theorem. It should be noted that the proposed method does not require information on the load torque and the rotor flux

The second work is from Mohammed SAID, Abdelhak LAKEHAL, Nora NAIT BOUDA, all together from, the “Laboratoire de Mécanique des Fluides Théorique et Appliquée, Université des Sciences et de la Technologie Houari Boumediene, Alger (Algérie) ». The title of this work is “The Dynamic flow behaviour in a Straight T-Bifurcating Channel“. This work deals with a two-dimensional (2D) numerical study of a turbulent flow in a rectangular T-bifurcating duct. The configuration refers to the cooling mechanism existent in the stator of the electrical machines. Indeed, radial vents are placed vertically to the rotor-stator airgap to ensure airflow. Therefore, a better understanding of the flow behaviour in the bifurcation is important. The effect of branch aspect ratio is particularly investigated in this purpose. In their work, “A two-dimensional (2D) numerical study of a turbulent flow in a rectangular T-bifurcating channel was carried out”. The $k-\omega$ SST turbulent model was used to study the impact and effect of the aspect ratio on the dynamic behaviour of the flow and its performance was evaluated. The structure and behaviour of the flow in the bifurcation channel has been evolved for two flow ratios and different aspect ratios.

The third paper with a title “The Effect of Rheological Carreau-Yasuda Parameters on Double Diffusive Convection in a square Cavity enclosure Submitted to gradient of Temperature and Concentration” from Selma LOUNIS Department of Process Engineering and Environment, University of Medea LME- Materials and Environement Laboratory Medea (Algeria); Redha REBHI Department of Mechanical Engineering, University of Medea, LERM- Renewable Engergy and Material Laboratory Medea (Algeria); Noureddine HADIDI Department of Process Engineering and Environment, University of Medea, LME- Materials and Environement Laboratory Medea (Algeria) presents a numerical study of doubly diffusive natural convection in an inclined square cavity filled with a non-Newtonian fluid subjected to a temperature and concentration gradient on the active walls, while the other walls are impermeable and adiabatic, are presented in this study. Any approximation of asymptotic parallel flow is applied to determine the onset of subcritical convection. These authors conclude that the Double diffusive natural convection the Carreau-Yasuda rheology effects and inclination angle in a square cavity saturated with non-Newtonian fluid has been studied while heat and mass transfer is analyzed. The governing parameters of the problem are the rheological parameters of the Carreau-Yasuda model, the Rayleigh number, and inclination angel.

The fourth paper of Youcef MAALEM (LESEI, Faculty of Technology, University of Batna 2, Algeria); Mohammed MEHEMMAI (LESEI, Faculty of Technology, University of Batna 2, Algeria) ; Abdnour ZERFA (LCIP, Faculty of Sciences and Technology, University of Khenchela, Khenchela, Algeria) whose title is “Efficiency Evaluation and Environmental Impact of Various Ecofriendly Single-Refrigerants as Alternatives to Replace R134a in Mechanical Vapor Compression Refrigeration Machine“. This study focuses on energy performance investigation and environmental impact analysis of various single-refrigerants (R1234yf, R1234ze, R161 and R13I1) as possible alternatives to high global warming potential refrigerant R134a. To reach this objective, a numerical model is developed to evaluate and compare the cycle performance parameters of the single-refrigerants considered in this work with R134a, like cooling capacity, coefficient of performance, volumetric refrigerating capacity and the pressure ratio. The comparison was made at evaporating temperatures (T_e) ranging from (-10 to 10 °C) and the constant condensation temperature (T_c) of 50 °C. These authors admit that in this study, the performance of these single-refrigerants as alternatives to R134a in mechanical vapor compression refrigeration system was investigated theoretically.

The fifth paper from BOUDNAYA Jaouad ; CHERRAT Marouan ; GHARIB Ilham ; MKHIDA Abdelhak Of Moulay Ismail University, ENSAM Meknes, Laboratory of Mechanics, Mechatronics and Control (L2MC, Meknes, Morocco), whose paper is about “A Remaining Useful Life Prediction of a robot with 15 states”. The work presented in this paper consists of the identification of the degradation indicator and the prognosis of the Remaining Useful Life (RUL) of a robot system. This system is composed by a robot that can move within an area of 15 squares, it is made up of sensors, which detects obstacles in four directions: north, south, east and west. This system is modeled by Hidden Markov Model (HMM). This strategy is considered as a trigger of a maintenance operation. In this work, they have presented the methodology of determination of degradation indicator and the prediction of the RUL of a robot system that can move within an area of 15 tiles. It is equipped with a sensing system, which can detect obstacles in four directions: north, south, east and west.

The objective of the sixth and last article from Bouhadiba Brahim., Aissani Nassima., Mekakia Mokhtaria., Lounis Zoubida., Guetarni Islam HM, du Laboratoire d'ingénierie en sécurité industrielle et développement durable de Université Mohamed Ben Ahmed Oran2, Algérie) dont le thème porte sur “les Perspectives conceptuelles et méthodologiques pour la mise en œuvre de la gestion des déchets ménagers et assimilés dans la ville d'Oran (Algérie)” consiste à développer un outil d'aide à la décision pour les gestionnaires publics dans le processus de gestion durable des déchets dans les villes d'Algérie et en particulier la Wilaya d'Oran. Il vise à contribuer à la mise en place d'une stratégie globale de gestion durable des déchets dans cette ville, en mettant à disposition des données quantitatives et qualitatives sur la production de déchets ménagers et assimilés, ainsi qu'à proposer une méthodologie qui sera dédiée à la caractérisation des ces résidus, afin de réduire leurs impacts susceptibles de nuire à la santé et/ou à l'environnement. Dans les pays en développement, l'absence de gestion rationnelle des déchets solides urbains a pour conséquence la dégradation de la propreté des villes et notamment des quartiers périphériques insalubres où s'entassent des populations pauvres et fragiles de plus en plus nombreuses en raison de l'exode rural. Ces auteurs concluent que La gestion des résidus solides urbains est devenue un problème de plus en plus complexe en Algérie à cause de l'évolution constante du contexte technique et économique. Les collectivités locales doivent faire face à de nombreux problèmes liés aux aspects sociaux, économiques, politiques et administratifs. Les tâches des walis et gestionnaires de la ville (dans l'environnement) devraient être grandement facilitées par une détermination précise des objectifs et des données de terrain fiables.

Pr. BENBAYER Habib

Editeur en Chef