CURRICULUM VITAE

PERSONAL DATA

- Name:**NohaAlaa El-Din Mohamed Saad El-Din**
- Date of birth: **15/09/1985.**
- Nationality:**Alexandria, Egyptian.**
- Academic Rank: **Assistant Professor**
- University: **Pharos University in Alexandria**
- Faculty: **Faculty of Engineering**
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ACADEMIC DATA

*Phd.

- **University:** Alexandria University, Faculty of Engineering
- **Department:** Mechanical Engineering Department
- **Date:** March 2020
- **Thesis Title:** Heat Transfer of Swirling Radial Flow Between Parallel Circular Disks and Its Heat Exchangers Applications
- **Supervisor:** - Prof. Dr. Medhat Mahmoud Sorour
  Prof. Dr. Mohamed Abdelfatah Fayed
- **Thesis Abstract:**The steady forced convection between two stationary parallel circular disks in a radial sink flow cooling system is numerically investigated. The inward flow between two circular disks resembles flows that occur in many engineering applications such as solar chimney power plant collector, exit of a geothermal reservoir and disk type heat exchangers. In recent years, the higher cost of energy and material directed investigators in developing more efficient and compact heat exchangers, and more effort aimed at development of the heat transfer and effectiveness of heat exchangers. For these applications, techniques for enhancing heat transfer rate are required. A literature review shows that many investigators studied the fluid dynamics for flow between stationary and/or rotating disks but less heat transfer studies with stationary disks were conducted.This investigation is devoted to study the effect of swirling flow and /or grooved surface

on the heat transfer and the thermo-hydraulic parameter of the flow between two circular disks. Moreover, it is suggested to study the effectiveness-NTU analyses in a circular disks heat exchanger with radial and swirling sink flow for a wide range of Reynolds number, as an application on the study of the swirling inflow between two circular disks. Turbulent steady and incompressible radial flow is numerically studied using the commercial code (FLUENT 6.3). The validation study demonstrates the good predictions of the numerical model used. A wide range of inlet Reynolds number (Re), $100 \le Re \le 10^5$, inlet swirl ratio (S), $0 \le S \le 20$ and the gap spacing ratio (G), $0.01 \le G \le 0.1$ is considered in the study. The rectangular grooves are characterized by ribs with three dimensionless lengths; height (t/δ), $0.1 \le t/\delta \le 0.35$, the interval spacing between ribs (i/R_o), $0.025 \le i/R_o \le 0.1$, and the width of rib (w/R_o), $0.025 \le w/R_o \le 0.1$. For the circular disks heat exchanger study, the variation of the thermal effectiveness and the number of transfer units (NTU) are presented with hot water Reynolds numbers (Re_h), $50 \le Re_h \le 10^4$, for different cold water flow rates with a wide range of the capacity ratio (Cr), $0.1 \le Cr \le 1.0$. The study considered the pure radial sink flow (S=0.0) and the strong swirling sink flow (S=20), for the two designs of the flow arrangements of the circular disk heat exchanger (distributed and undistributed). The numerical results are reported as stream lines, pumping friction factor ratio, local Nusselt number, average Nusselt number and thermo-hydraulic performance factor. While for the circular disks heat exchanger study the results are reported for temperature contours and the effectiveness – NTU results. Moreover, correlations for the effectiveness – NTU relation are resolved.In addition, it is studied the outflow (source flow) with the ribs on the lower disk. Results have clearly shown that the ribs on lower disk can significantly increase heat transfer capabilities of radial source flow cooling systems.Finally, recommendations and some of studying points that we hope to be studied in the future are listed.

*M.Sc.

- **University:** Alexandria University, Faculty of Engineering
- **Department:** Mechanical Engineering Department
- **Date:** **May2011**
- **Thesis Title:** Laminar Mixed Convection Inside A Square Enclosure With Discrete Heat Sources And Ventilation Ports
- **Supervisor:** - Prof. Dr. Medhat Mahmoud Sorour
  Dr. Mohamed M. Khairat
- **Thesis Abstract:**A numerical investigation has been carried out for laminar mixed convection inside a partially opened square enclosure with discrete heat sources embedded on vertical boards which situated on the bottom wall of the enclosure. It was indicated the importance of heat and mass transfer in different engineering and industrial applications and the aim of this study was illustrated. A mathematical model for the heat transfer problem within a square enclosure was presented and the method of calculating the pressure inside the cavity was illustrated. The governing equations are transformed into the dimensionless form to be in the general form and schematic

diagrams are plotted to clarify the boundary conditions. The numerical method used in solving the model which is Patankar and Spalding based on finite volume technique. The solution of the mathematical model is presented by assuming the heat transfer fluid is air by keeping Prandtl number is fixed at 0.7 and the thermal Grashof number was taken 10^4. The numerical results of the streamline, isothermals contours are obtained for a wide range of Richardson number (Ri), $0.01 \leq Ri \leq 100$, dimensionless spacing between boards (S), $0.1 \leq S \leq 0.4$ and the dimensionless boards' height (H_b), $0.25 \leq H_b \leq 0.75$, for different arrangements of outlet port positions and boards' positions. The predicted results for average Nusselt number were correlated in terms of boards' height, spacing between boards and Richardson number for different arrangements of outlet port positions and boards' positions. In the enda summary of the results and recommendations were presented and some of studying points were illustrated to be studied in the future.

*B.Sc. (Bachelor of Mechanical Engineering Sciences)

- **University:** Alexandria University, Faculty of Engineering
- **Department:** Mechanical Engineering Department
- **Date:** June-2007
- **Grade:** 77.4% - (Very Good)
- **Grade of last year:** 85% Excellent
- **B.Sc. Project:** Simulation and performance of combined cycle power station. [Gas cycle-Steam cycle-Theoretical study-Performance of Nobaria power plant.].
  The Project was underSupervision of " Prof. Dr. Mohamed Abd-El-Fatah Teama", and **the Project Grade** was "Excellent".

PUBLICATIONS

1. **" Mixed Convection Inside Square Enclosure with Discrete Heat Sources at Different Arrangement and Ventilation Ports"**, European Journal of Scientific Research, Vol.70 No.1 pp. 128-147, 2012
2. **"Heat Transfer Enhancement by Using Corrugated Surface in Laminar Radial Flow Cooling System with Nano-Fluids",** 6th INTERNATIONAL CONFERENCE ON ENERGY RESEARCH & DEVELOPMENT (ICERD – 6)
3. **"Heat Transfer Enhancementin a Radial Turbulent Sink FlowCooling System EMPLOYMENT HISTORY",** Journal of thermal science and engineering applications, Vol. 11, pp. 031003-1 - 031003-11, June 2019.

Employment History

June 2020 – present	Assistant Professor, Mechanical Engineering Department, Faculty of Engineering, Pharos University in Alexandria.
September 2011 – May 2020	Teacher Assistant, Mechanical Engineering Department, Faculty of Engineering, Pharos University in Alexandria.
September 2008 – August 2011	Demonstrators, Mechanical Engineering Department, Faculty of Engineering, Pharos University in Alexandria.
September 2007 – June 2008	Part time administrator in faculty of engineering-Alexandria University, teaching: mechanical drawing, AutoCAD and Eng. physics for preparatory year.

OTHER SKILLS

- I do like hard work and keen on learning as much as possible in the shortest time. My cooperative behavior will be a solid asset in this respect.
- Capable of working in groups as well as alone and under stress.

OTHER SKILLS

- References available on request