RESEARCH PUBLICATIONS IN JOURNALS

- M. A. I. El-Shaarawi and A. A. Al-Ugla, Transient Moment to Rotate Inner Walls of Vertical Concentric Annuli in the Natural Convection Regime, Int. J. Numerical Methods for Heat and Fluid Flow, Accepted
- M. A. I. El-Shaarawi, E. M. A. Mokheimer and A. Jamal, "Geometry Effects on Steady Conjugate Natural Convection Heat Transfer in Vertical Eccentric Annuli", Int. J. Numerical Methods for Heat and Fluid Flow, Vol. 17, No 5, 2007, 461-493.
- E. Mokheimer and M. A. I. El-Shaarawi, "Maximum Possible Induced Flow Rates in Open-ended Vertical Eccentric Annuli with Uniform Heat Flux", Int. J. Numerical Methods for Heat and Fluid Flow, Volume 15, Issue 2, April 2005, pp. 161-182.
- E. M. A. Mokheimer and M. A. I. El-Shaarawi, "Critical Values of Gr/Re for Mixed Convection in Vertical Eccentric Annuli With Isothermal /Adiabatic walls, *Journal of Heat Transfer, Transactions of the American Society of Mechanical Engineers* (ASME), Vol.126, Series C, June 2004, pp. 479-482.
- M. A. Antar and M. A. I. El-Shaarawi, Effect of Viscosity, Spin and Reynolds Number on the Flow Characteristics About a Liquid Sphere in a Gas Stream, *International Journal of Numerical Methods for Heat & Fluid Flow*, Vol. 12, No. 7, April 2002, pp. 800-816.
- M. A. I. El-Shaarawi and S. A. Haider, Critical Conductivity Ratio for Conjugate Heat Transfer in Eccentric Annuli, *International J. of Numerical Methods for Heat & Fluid Flow*, Vol. 11, No. 3, April 2001, pp. 255-277.
- M. A. I. El-Shaarawi and A. A. A. Negm, Conjugate Natural Convection Heat Transfer in an Open-ended Vertical Concentric Annulus, *Numerical Heat Transfer*, Series A, Vol. 36, No. 6, 1999, pp. 639-655.
- M. A. I. El-Shaarawi and E.Mokheimer, Developing Free Convection in Open-ended Vertical Eccentric Annuli with Isothermal Boundaries, *ASME J. Heat Transfer*, Vol. 121, No.1, February 1999, pp.63-72.

- M. A. I. El-Shaarawi, H. I. Abualhamayel, and E. Mokheimer, Developing Laminar Flow in Eccentric Annuli, *Journal of Fluids Engineering, Transactions of the American Society of Mechanical Engineers (ASME)*, Series I, Vol. 119, No.3, September 1997, pp. 724- 728.
- M. A. I. El-Shaarawi, A. Al-Farayadhi, and M. A. Antar, Boundary Layer Flow About and Inside a Liquid Sphere, *Journal of Fluids Engineering, Transactions of the American Society of Mechanical Engineers (ASME)*, Series I, Vol. 119, No.1, March 1997, pp.42-49.
- M. A. I. El-Shaarawi, and E. Mokheimer, "Transient Conduction in Eccentrically Hollow Cylinders, "*Int. J. Heat and Mass Transfer*, Vol. 38, 1995, pp.2001-2010
- M. A. I. El-Shaarawi, "On The Psychrometric Chart," *ASHRAE Transactions*, Paper # 3736, Vol.100, Part 1, 1994, pp.11-20.
- M.A.I. El-Shaarawi and M. Al-Attas, "Transient Induced Flow Through a Vertical Annulus," *Japan Society of Mechanical Engineers (JSME) International Journal*, Series B, Vol.36, 1993, pp.156-165
- M. A. I. El-Shaarawi and M. K. Alkam, "Transient Forced Convection in the Entrance Region of Concentric Annuli," *International Journal of Heat and Mass Transfer*, Vol.35, 1992, pp.3335-3344
- M. A. I. El-Shaarawi, N. T. Ahmad and Z. Kodah, "Mixed Convection about a Rotating Sphere in an Axial Stream," *Numerical Heat Transfer*, Part A, Vol.18, 1990, pp.71-93
- Z.Kodah and M. A. I. El-Shaarawi, "Weather Data in Jordan for Conventional and Solar HVAC Systems," *American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Transactions*, Vol.96, Part I, 1990, pp.124-131.J.
- M. A. I. El-Shaarawi and M. A. Al-Nimr, "Fully Developed Laminar Natural Convection in Open Ended Vertical Concentric Annuli," *International Journal of Heat and Mass Transfer*, Vol.33, No.9, 1990, pp.1873-1884

- M. A. I. El-Shaarawi and K. Khamis, Induced Flow in Uniformly Heated Vertical Annuli with Rotating Inner Walls," *Numerical Heat Transfer*, Vol.12, 1987, pp.493-508.
- M. A. I. El-Shaarawi and S. A. El-Bedeawi, "Consistency, Stability and Convergence of the Finite Difference Equations for Flow About a Rotating Sphere in an Axial Stream," *International Journal for Numerical Methods in Fluids*, Vol.7, 1987, pp.825-831.
- M. Alarabi, M. A. I. El-Shaarawi and K.Khamis, "Natural Convection in Uniformly Heated Vertical Annuli," *International Journal of Heat and Mass Transfer*, Vol.30, No.7, 1987, pp.1381-1389.
- M. A. I. El-Shaarawi, M. M, Kemry and S. A. El-Bedeawi, "Further Studies on Laminar Flow About a Rotating Sphere in an Axial Stream," *Journal of Fluids Engineering, Transactions of the American Society of Mechanical Engineers* (ASME), Vol.109, 1987, pp.75-77.
- M. A. I. El-Shaarawi and R. A. Ramadan, "Solar Refrigeration in the Egyptian Climate," *Solar Energy*, Vol.37, No.5, 1986, pp.347-361
- M. A. I. El-Shaarawi, M. F. El-Refaie and S. A. El-Bedeawi, "Numerical Solution of Laminar Boundary Layer Flow About a Rotating Sphere in an Axial Stream," Journal of Fluids Engineering, Transactions of the American Society of Mechanical Engineers (ASME), Vol.107, 1985, pp.97-104.
- M. A. I. El-Shaarawi and A. Sarhan, "Combined Forced-Free Laminar Convection in the Entry Region of a Vertical Annulus with a Rotating Inner Cylinder," *International Journal of Heat and Mass Transfer*, Vol.25, No.2, February 1982, pp.175-186.
- M. A. I. El-Shaarawi and A. Sarhan, "Developing Laminar Free Convection in a Heated Vertical Open Ended Concentric Annulus," *Industrial and Engineering Chemistry Fundamentals* (I & EC Fundamentals), American Chemical Society, Vol.20, No.4, 1981, pp.388-394
- M. A. I. El-Shaarawi and A. Sarhan, "Developing Laminar Free Convection in an Open Ended Vertical Annulus with a Rotating Inner Cylinder," *Journal of Heat Transfer, Transactions of the American Society of Mechanical Engineers* (ASME), Vol.103, Series C, No.3, August 1981, pp.552-558.
- M. A. I. El-Shaarawi and A. Sarhan, "Free Convection Effects on the Developing Laminar Flow in Vertical Concentric Annuli," *Journal of Heat Transfer, Transactions of the American Society of Mechanical Engineers (ASME)*, Vol.102, Series C, No.4, November 1980. pp. 617-622.

- Bosman and M. A. I. El-Shaarawi, "Quasi-Three-Dimensional Numerical Solution of Flow in Turbomachines," *Journal of Fluids Engineering, Transactions of the American Society of Mechanical Engineers (ASME)*, Series I, Vol.99, No.1, March 1977, pp.132-140.
- J. E. R. Coney and M. A. I. El-Shaarawi, "A Contribution to the Numerical Solution of Developing Laminar Flow in the Entrance Region of Concentric Annuli with Rotating Inner Walls," *Journal of Fluids Engineering, Transactions of the American Society of Mechanical Engineers (ASME)*, Series I, No.4, December 1974, pp.333-340.
- J.E. R. Coney and M. A. I. El-Shaarawi, "Heat Transfer in the Entrance Region of Concentric Annuli with Rotating Inner Walls," *Journal of Heat Transfer, Transactions of the American Society of Mechanical Engineers*, Series C, Vol.96, No.4, November 1974, pp.560-562.