Contribution ID: **46** Type: **not specified**

Modelling the impact of Temperature-Dependent Specific Heat Capacity of Tri-hybrid Casson Nanofluid for enhanced solar panels.

Tuesday, 28 May 2024 16:45 (10 minutes)

Abstract:
The transition to solar energy is pivotal in addressing global energy challenges, offering a clean and renewable alternative to fossil fuels. However, to maximize the potential of solar power, there is critical need to enhance the efficiency and reliability of solar panels. This study focuses on modeling the influence of temperature-dependent specific heat capacity in Tri-hybrid Nanofluid to optimize solar panel performance. The system of governing Partial Differential Equations was formulated by incorporating variable temperature-dependent specific heat capacity, magnetic field, and thermal radiation, and later transformed into a system of Ordinary Differential Equations by similarity techniques. The resulted ODEs were solved numerically using Python software. The simulation results show that the temperature profile declines as the variable specific heat capacity parameter increases. It can be concluded that temperature-dependent thermophysical properties (specific heat capacity) and radiation have a significant influence on enhancing the tri-hybrid nanofluid for improved solar panels. By addressing thermal management challenges, such as heat dissipation and temperature regulation, the results surface significant improvements in efficiency and reliability, with potential real-life applications including increased energy output and prolonged lifespan of solar panels, contributing to a more sustainable energy future.
Keywords: Modelling, Solar panels, Tri-Hybrid nanofluid, Python.

Primary authors: Dr ASELEBE, LATEEFAT OLANIKE (Dept. Of General Studies (Mathematics) Federal School of Surveying Oyo); OBANSOLA, OLUWATOYIN YEMI (DEPARTMENT OF COMPUTER SCIENCE, FEDERAL SCHOOL OF SURVEYING, OYO)

Co-authors: Mr TITILADE, Adedeji Samuel (DEPARTMENT OF SURVEYING & GEOINFORMATICS, FEDERAL SCHOOL OF SURVEYING, OYO); OMOLOBA, OLUWATOYIN (DEPARTMENT OF COMPUTER SCIENCE, FEDERAL SCHOOL OF SURVEYING, OYO)

Presenter: Dr ASELEBE, LATEEFAT OLANIKE (Dept. Of General Studies (Mathematics) Federal School of Surveying Oyo)

Session Classification: Technical session 4

Track Classification: Mathematics: Applied mathematics