ABSTRACT I

Detection of Multiple Outliers in Circular-circular Regression Model by using Single-linkage and Minimum Spanning Tree (MST) Procedure.

Nur Faraidah Binti Muhammad Di

This study presents a new procedure for detecting multiple outliers in circular-circular regression model. The proposed procedure is extended from single-linkage based procedure by adding minimum spanning tree (MST) method to the procedure. The aim of this study is to examine the performance of the procedure after the addition of MST. The performance of the proposed procedure has been demonstrated by using simulation study with different number of sample sizes and level of contaminations. The results revealed that the proposed procedure was performed remarkable well as compared to single-linkage based clustering procedure with small masking and swamping error.

ABSTRACT II

Numerical Construction of Deformation Field in Converging Channel

Syafikah Binti Ayob

This work proposes the computational method for the construction of the stress field in the deformation region in a converging channel. The stress components are assumed to satisfy Mohr-Coulomb yield criteria under plane strain condition. The governing equation for the model is the first-order partial differential equation, which is the stress equilibrium equations. The deformation region is made up of the union of adjacent elementary boundary value problem and solved numerically. The region is constructed by using Matlab, and it shows the formation of the two symmetrical deformation region at both upper and lower part of the converging channel. From the computation, we obtained the stress variables and the velocity distribution in the deformation region. The work rate for the corresponding velocity was calculated, then it is shown that the solutions are physically significant since the condition of the work rate is everywhere positive. This method is of great interest as it will bring about an increase in efficiency and hence improvement in industrial productivity, especially in designing granular flow device. The technique is also an alternative for the solution of the deformation problems as it is simple and more reliable.

ABSTRACT III

Mixed Convection Flow of Temperature Dependent-Viscosity of Non-Newtonian Eyring Powell Fluid Interact with Dust Particle Moving Over a Vertical Stretching Sheet

Ahlam Mahmoud Aljabali

Two-phase flow problem has attracted considerable attention of many researchers due to its potential in investigating the flow characteristics of binary mixture of fluid and solid particles. The advancement in fluid mechanics has led to the development of innovative way in investigating the suspension of solid particles in fluid flow known as two-phase flow model, which describing the behavior of fluid-solid system. The industrial applications like transportation of petroleum, treatment of waste-water, emission of smoke from vehicles, piping of power plants and corrosive particles in mining generally involve the activities of fluid-solid movement. In this work, the mixed convective flow of non-Newtonian Eyring Powell fluid flow, the effects temperature-dependent viscosity (TDV) are studied interact with dust particles under the influences of Newtonian Heating (NH) boundary condition which is moving over a vertical stretching sheet . Alternatively, the dusty fluid model is the two-phase flows that consist of phases of fluid and dust. The derivation of the governing equation for both phases is one of the difficulties in this study. Mainly present PDEs (fluid and dust phase) are transformed to non-dimensional form by invoking similarity transformations that are then numerically overcome by the Keller-box scheme. Comparison with the published literature evidence verifies the precision of the analytical tests. Graphical diagrams, velocity, and temperature profiles (phases of fluid and dust) converse for different influential parameters. Effects of friction factor and heat transfer rate are applied and evaluated Investigations found that the temperature distribution of fluid and dust phase plus velocity is determined by the parameters measured in a common model. Whereas the impact of parameters mass concentration of particle phase, fluid-particle interaction and Eyring fluid parameters is noted stronger on the velocity distribution. The temperature range is found more prominent with the frequency of the Prandtl number parameter for both processes, affecting even the basic heat ratio of the mixture on the fluid side, fluid-particle interaction parameters, and dust side mass concentration.