Editorial

Mapana-Journal of Sciences is in the eleventh year of publication. This issue (No. 3) and the issue (No. 4) are dedicated to the International Conference on Emerging Trends in Fluid Mechanics and Graph Theory organized by the Department of Mathematics during 16-18 August 2012.

The first article by Akira Nakayama explicates in sufficient detail the volume averaging theory to momentum and heat transfer within complex flow systems. The validity of the procedure is ascertained by means of applications concerning heat exchangers, composting systems and human bodies.

The second article by V Ramakrishnareddy and M Subbiah deals with study the nonlinear stability of steady flows of inviscid homogeneous fluids in sea straits of arbitrary cross sections. Certain stability theorems for steady basic flows and examples of stable basic flows are addressed within the framework of finite amplitude disturbances.

The third article on the problem of steady, MHD, mixed convection flow of an incompressible viscous fluid past a semi-infinite vertical permeable plate with slip condition at the boundary layer by J Prakash et al makes use of the perturbation technique to find the closed form solution of the problem. The effect of shear stress, rate of heat and mass transfer coefficients at the channel walls are elucidated.

Julie Andrews and S P Anjali Devi carried out an analysis to study the problem of the steady flow and heat transfer over a rotating disk with a prescribed heat flux in nanofluid. The Nachtsheim-Swigert shooting iteration technique along with the fourth order Runga-Kutta method is employed to disclose the features of the flow and heat transfer characteristics associated with the problem.

The article by S Manjunath and L Venkata Reddy is concerned with the study of velocity profiles in a hydromagnetic flow of Boussinesq-Stokes suspension over an exponentially stretching impermeable sheet. The authors employed the differential transform method to examine the effect of local Chandrasekhar number and couple stress parameter on velocity profiles.

K R Jayakumar et al performed an analysis to investigate the mixed convection flow over a vertical cone with an applied magnetic field when

the axis of the cone is in line with the flow. The results are presented for assisting and opposing flows. The partial differential equations governing the non-similar flow are solved by an implicit finite difference scheme coupled with the quasilinearization technique.

The article by M S Jagadeesh Kumar et al deals with the problem of dispersion in a non-linear non-Darcy flow of a variable viscosity liquid. A series solution is obtained for the Darcy-Forchheimer-Brinkman equation using the differential transform method and using this solution the influence of the variable viscosity coefficient and the Darcy, Brinkman and Forchheimer numbers on the all-time valid dispersion coefficient is examined.

S Manjunath and N P Chandrashekara studied the problem of two-dimensional steady thermal convection in micropolar fluid occupying a rectangular box. By means of a Fourier series assisted numerical method, the critical Rayleigh number is obtained as a function of coupling parameter, couple stress parameter and aspect ratio.

The article by B Umadevi et al focuses on the study of dispersion in an eccentric annulus region by taking blood as a Newtonian fluid with the investigation of oxygen transfer to the tissue cells in an eccentric catheterized artery. Numerical computations are carried out to understand the simultaneous effects of absorption parameter and eccentricity on the flow with respect to time.

B H Lakshmana Gowda and N Gopi investigated influence of relative length of baffles on the flow field in a rectangular enclosure. Computations are carried out using the CFD code Fluent employing the finite volume method.

A N Mullick et al carried out a numerical simulation of turbulent flow through a curved duct. This article presents the comparison the results of an experimental work with a numerical work keeping the geometry of the test duct and inlet boundary conditions unaltered. The turbulence models are investigated using the CFD code Fluent.

The article by Ramprakash Sharma and Abhay Kumar Jha is concerned with heat transfer in MHD micropolar fluid flow past a vertical plate in slip-flow regime. Numerical calculations for the distribution of the translational velocity, micro rotation, temperature and concentration across the boundary layer are carried out.

S Pranesh and R V Kiran investigated the effect of non-uniform temperature gradient on the onset of Rayleigh-Bénard magnetoconvection in a micropolar fluid with Maxwell–Cattaneo law using the Galerkin technique. The article resorts to the non-classical theory involving a wave type heat transport and one linear and five non-linear temperature profiles are considered.

B D C N Prasad et al have analyzed the problem of mixed convection along a vertical plate in a non-Newtonian fluid saturated non-Darcy porous medium in the presence of melting, thermal dispersion-radiation effects for aiding and opposing external flows. The equations resulting from similarity solution are numerically solved by Runge-kutta fourth order method coupled with shooting technique.

We are appreciative of the cooperation and support extended by the authors and reviewers. We look forward to receiving your feedback on the articles brought out in this issue.

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