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Abstract–This paper deals with the useful way to analyze harmonic steady state of electric circuits with inductances that are electrically or magnetically shielded with electrically conductive jacket. Parameters of shielded coils, so called complex self- and mutual inductances, are defined and several approaches of their numerical calculation are showed. These parameters allow both classical approach to build a set of circuit equations and they can be used to determine the eddy current losses in the shielding in a very simple way.

Abstract–Ultrahigh-frequency (UHF) band radio frequency identification (RFID) tag antennas are deemed as paramount and beneficial elements in many diverse applications in the frequency range of 860–960 MHz. Two different design of tag antennas are investigated and presented in this paper which are dipole antennas and meander line antennas. It is shown that dipole antenna has bigger size compared to meander line antenna. The dipole antenna functions in dual-band frequency at two resonance frequencies of 910 MHz and 2.5 GHz. Meander line antenna operates in UHF frequency with resonance frequency of 910 MHz. The dipole antenna provides broad uniaxial lobe radiation pattern, while meander line antenna give omnidirectional pattern. The substrate material used in this paper is FR4 with dielectric constant of 4.6 and thickness of 1.6 mm. Comparison is carried out on the characteristics of the antennas including the size, return loss, radiation pattern and other performances.

Abstract–In this analysis, the effects variable heat flux and thermal radiation on MHD flow and heat transfer over an unsteady permeable stretching sheet in a porous medium with mass suction/injection are investigated. The basic equations of flow are converted to self-similar ordinary equations adopting suitable similarity transformations. Shooting method is used to obtain numerical solutions of the transformed self-similar equations. Simultaneous effects of variable heat flux, thermal radiation, magnetic field and resistance for porous medium on the unsteady flow and heat transfer are obtained. It is found that for magnetic field and the medium of flow being porous, the velocity decreases and temperature increases. Also, mass suction has similar effect on the velocity profile. Temperature and thermal boundary layer thickness decrease with unsteadiness, Prandtl number and variable heat flux with high rate of heat transfer from the sheet to the ambient fluid. Whereas, for stranger magnetic field the heat transfer rate reduces.

Abstract–A theoretical analysis of the motion of a free convective visco-elastic fluid through a porous medium in a vertical channel with dissipation, radiation and mass transfer under the influence of a transverse magnetic field has been considered. The fluid is characterized by second-grade model which follows from generalized Rivlin-Ericksen fluid. Approximate solution of the problem is obtained by using regular perturbation technique. Analytical expression for velocity, temperature, shearing stress, Nusselt number and Sherwood number have been obtained and illustrated graphically with the combination of various pertinent parameters involved in the solution.

Abstract–Elastic-plastic analysis was performed of mode II delamination fracture in the End Loaded Split (ELS) layered beam configuration. The J-integral approach was applied. Analytical solutions of the J-integral were obtained by using an elastic-plastic model with power law hardening. The influence of plastic zones length and power law exponent on the mode II fracture was analyzed. The J-integral analytical solutions obtained are very useful for parametric investigations, since the simple formulae derived capture the essentials of mode II elastic-plastic fracture behavior. The results obtained can be applied for optimization of layered beams structure with respect to the fracture performance. The present paper contributes towards the understanding of fracture in layered beams that exhibit elastic-plastic material behavior.

Vehicle path following with the presence of driver commands is considered one of the important issues in vehicle active safety systems development and more realistic simulation of vehicle performance. It can result in reduction of the traffic congestion and overall number of accidents. So, the main contribution of this paper is the development of a controller for 3 degree of freedom vehicle model in which consideration of longitudinal and lateral dynamics of vehicle is included to increase vehicle active safety. Therefore, the proposed controller applies corrective steering angle and direct yaw moment on wheels based on image processing and optimized controller to track the desired path. The performance of developed controller is verified by comparing the simulation results with previous experimental results. Simulation results illustrate dominating efficiency of driver controller in the vehicle stabilization and handling condition by reducing lateral acceleration and velocity during lane change maneuver. It can be concluded that image processing and optimized controller improve vehicle path tracking by detecting lane.

Abstract–Electronic Chart Display and Information System (ECDIS) is a sailing positioning and navigation information system. ECDIS can place static and dynamic information detected by radar on electronic chart, which reduces the risks of excessive depending on electronic chart. Moreover, taking electronic chart as a basis can effectively display the driving condition of ships and provide complete information and records for sailors. As the traditional ECDIS only displays large scale, it has limitations for ships which operate in short distance; it is also not able to detect marine hydro-meteorology data. Therefore, the system has certain defects. This study added three-dimensional (3D) display technology to ECDIS and regarded it as a complementary subsystem to analyze position information and motion parameters, display the motion of ships using open gallery program in 3D, process marine hydro meteorology data and generate visual graphics and images. It was found that the system could clearly display 3D navigation environment, accurately position lane and navigational speed, and further improved seaway monitoring and navigation safety; it could also clearly display cloud atlas and typhoon track. The system developed in this study was more advanced; hence it is worth applying where possible.