investigated. Also the inform of the frictional contribution on the rate of reaction and ignition time have been investigated.

**Keywords:** Thermal Explosion, Internal friction, ignition time, Semenov Parameter. Stationary theory, Frank-Kamenetskii.

## D5: EFFECT OF RADIATIVE HEAT TRANSFER ON MHD FLOW WITH VARIABLE VISCOSITY AND THERMAL CONDUCTIVITY OVER A STRETCHING SURFACE

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**Abstract**

An analysis has been carried out to discuss the nonlinear MHD, steady, two dimensional, laminar boundary layer flows with heat transfer characteristics of an incompressible, viscous, electrically conducting and radiating fluid with variable viscosity over a surface stretching with power-law velocity in the presence of a variable magnetic field and nonlinear radiation effects. The fluid is assumed to be a gray, emitting, absorbing but non-scattering medium. Governing nonlinear partial differential equations are transformed to nonlinear ordinary differential equations by utilizing suitable similarity transformation. Then the resulting nonlinear ordinary differential equations are solved numerically using the Nachtsheim-Swigert iteration shooting technique for satisfaction of asymptotic boundary conditions by Runge-kutta fourth order method. The numerical results for velocity and temperature distribution are obtained for different values of viscosity measuring parameter, velocity exponent parameter, magnetic interaction parameter, surface temperature parameter, radiation parameter and Prandtl number. Values for skin friction coefficient and dimensionless rate of heat transfer are also obtained numerically for variation of physical parameters.

**Keywords:** Nonlinear Radiation, MHD flow, Stretching surface, power-law velocity & variable viscosity.

## D6: MATHEMATICAL MODELING FOR PREDICTING FIRE SPREAD IN A REAL-TIME COUPLED ATMOSPHERIC-WILDLAND FIRES

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**Abstract**

This paper presents a mathematical model for predicting fire spread in a real-time coupled Atmospheric-wild land fires. The model equations are solved analytically using direct integration and eigenfunction expansion technique. The results of the simulation are presented graphically using MAPLE package and discussed. It is observed that the parameter involved played a crucial role in the propagation of wild land fires.
**Keywords and Phrases:** Wildland, Fire spread, Crown fires, Prediction, Combustion

## D7: A SEMI – ANALYTICAL SOLUTION OF ONE - DIMENSIONAL CONTAMINANT FLOW PROBLEM INCORPORATING THE ZERO ORDER SOURCE PARAMETER

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**Abstract**

A semi – analytical study for a time dependent one – dimensional advection – dispersion equation (ADE) with Neumann homogenous boundary conditions for studying contaminants flow in a homogenous porous media is presented. The governing equation which is a partial differential equation includes terms like advection, hydrodynamic dispersion, and first order decay processes incorporating a zero order source effects. The velocity of the flow is considered exponential in nature. The solution was obtained using Eigen function expansion technique after a suitable transformation. The results which investigate the effect change in the parameters on the concentration were discussed and represented graphically. The study revealed that as the zero order source coefficient increases, the contaminant concentration decreases.
**Keywords:** Contaminants, zero order source, advection, dispersion, homogenous, Eigen functions.

## D8: ANALYTICAL STUDY OF THE EFFECTS OF CHANGE THE DECAY PARAMETER IN THE CONTAMINANT FLOW MODEL UNDER THE NEUMAN BOUNDARY CONDITIONS

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**Abstract**

The advection-dispersion equation is commonly employed in studying solute migration in a flow. This study presents an analytical solution of a two-dimensional advection-dispersion equation for evaluating groundwater contamination in a homogeneous finite medium which is initially assumed to be contaminant free. In deriving the model equation, we assume that there