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D04   Numerical prediction of land surface temperature using shallow water equation

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Abstract. In this thesis, we formulated a model for the prediction of Land Surface Temperature from shallow water equation using the Explicit Finite Difference Method, and the application of difference equations that resulted in the discretization of shallow water equation, with the incorporation of atmospheric scale height to predict the Land Surface Temperature (LST) of a place at a particular altitude. The following parameters were considered and well represented in our model formulation, meridional wind speed "v", scale height of pressure difference "H", coriolis force "f", time "t", gravitational force "g" and temperature "T". The study centers on the attempt to predict and analyze the behaviour of LST for a particular area using shallow water equation. The result derived from this study re-affirms the efficiency of Shallow Water Equation in making accurate predictions of the Land Surface Temperature. The result also revealed that the Land Surface Temperature increases with decrease in altitude

KEYWORDS: Land Surface Temperature, Zonal wind speed, Meridional wind speed, Scale height and Atmospheric altitude .

√D05   The Comparison of the Numerical and Analytical Solutions of Boundary Value Problems using Finite Difference Method

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Abstract. Finite-difference methods are numerical methods for approximating the solutions to differential equations using finite difference equations to approximate derivatives. In this research work, we have demonstrated the numerical methods for solving ordinary differential equations, starting with basic techniques of finite difference methods for boundary value problem. We used finite-difference method to provide numerical solutions for the boundary value problem and the result are compared with exact solution. The graphical summaries of the system responses are provided in this paper.

KEYWORDS: Boundary value problem: Exact solution; Ordinary Differential Equations; Finite Difference method.