1106-VL-1554 **Titus J. O. Aminer*** (titusaminer@yahoo.com), JOOUST, P. O. Box 210-40601, Bondo, +254, Kenya. *Lie Symmetry Solution of Fourth Order Nonlinear Ordinary Differential Equation.*

The equation $F(x, y, y', y'', y''', y^{(4)}) = 0$ is a one-space dimension version of wave equation. Its solutions can be classified either as analytic solutions or as numerical solutions using finite difference approach, where the convergence of the numerical schemes depend entirely on the initial and boundary values given.

An extensive literature exist on this subject but until quite recently, group theory has in this respect been unused. In this study, we have used Lie symmetry analysis approach to solve the wave equation given since the solution does not depend on either boundary or initial values and is not an approximation to the exact solution.

Thus in our search for the solution we exploited a systematic procedure of developing infinitesimal transformations, generators, prolongations (extended transformations), variational symmetries, adjoint-symmetries, integrating factors and the invariant transformations of the problem. The procedure is aimed at lowering the order of the equation from fourth to first order, which is then solved to provide its Lie symmetry solution. This is the main contribution to the knowledge and further research. (Received September 14, 2014)