**A Novel Technique for Estimating Aerosol Optical Thickness Trends Using Meteorological Parameters**

Moses E. Emetere\*1, Akinyemi M.L.1 & Akin-Ojo O.2

1*Physics Department, Covenant University, P.M.B. 1023, Ota-Ogun State, Nigeria*

*2Physics Department, University of Ibadan, Nigeria.*

moses.emetere@covenantuniversity.edu.ng

**Abstract.** Estimating aerosol optical thickness (AOT) over regions can be tasking if satellite data set over such region is very scanty. Therefore a technique whose application captures real-time events is most appropriate for adequate monitoring of risk indicators. A new technique i.e. arithmetic translation of pictorial model (ATOPM) was developed. The ATOPM deals with the use mathematical expression to compute other meteorological parameters obtained from satellite or ground data set. Six locations within 335 ˟ 230 Km2 area of a selected portion of Nigeria were chosen and analyzed –using the meteorological data set (1999-2012) and MATLAB. The research affirms the use of some parameters (e.g. minimum temperature, cloud cover, relative humidity and rainfall) to estimate the aerosol optical thickness. The objective of the paper was satisfied via the use of other meteorological parameters to estimate AOT when the satellite data set over an area is scanty.