

Abstract

This study sought to investigate the spatial and temporal variations of aerosols over Kenya based on Moderate Resolution Imaging Spectroradiometer (MODIS) satellite sensor Aerosol Optical Depth (AOD) data for the period between 2001 and 2012. A Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT) model was used for trajectory analysis in order to reconstruct the origins of air masses and understand the Spatial and temporal variability of aerosol concentrations. Validation of MODIS AOD using Aerosol Robotic Network (AERONET) indicated that MODIS overestimated the aerosol loading over the study region. Space time variability of MODIS AOD measurements over Kenya showed a decreasing trend in aerosol loading with a long term mean of between 0.02 and 0.56. Mean monthly AOD values showed two peaks during the months of July and December while seasonal variations indicated high aerosol loading during the December – January –February (DJF) and June –July –August (JJA) season. Back trajectory analyses showed that aerosols mainly dust and sea salt reaching Kenya were transported from either Arabian or Indian sub continent or western parts of the Indian Ocean respectively. Therefore, long term and more comprehensive satellite AOD retrievals are necessary in order to achieve a better understanding of spatial and temporal variations in aerosols over Kenya