OPTICAL AND MICROPHYSICAL CHARACTERISTICS OF AEROSOLS OVER EGYPT FROM NASA'S SATELLITES (2003-2014).

By

Nashaat Gad Abdalla Gad

A Thesis Submitted to the
Faculty of Engineering at Cairo University
In Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
In
Aerospace Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under the Supervision of

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Title of Thesis: Optical and Microphysical Characteristics of Aerosols over Egypt from NASA'S Satellites (2003-2014)

Key Words: Remote Sensing – Aerosols –Aerosols types – Aerosol spatial distribution – Aerosol seasonal pattern

Summary:

The main objective of this thesis is to develop the knowledge of usages of remote sensing data for monitoring aerosols (pollutants) over Egypt. This has been achieved by addressing the following items:

- Acquiring daily-average aerosol data from two space-borne sensors: NASA's MODIS and MISR as well as the ground-based AERONET station in Cairo over 12-year period (2003-2014).
- Inter-comparison of derived aerosol optical parameters from the three data sources, MODIS, MISR and AERONET station in Cairo, for the purpose validating MODIS and MISR Aerosol products, considering AERONET data as being truth data
- determining aerosols optical and microphysical characteristics from three data sets.
- Identify spatial and seasonal patterns of aerosols optical parameters over five selected cities: Alexandria, Cairo, Asyut, Hurghada and Aswan as well as two regions: Western Desert and Nile Delta then the entire country.
- Using the available optical properties as proxy indictor of aerosol types. Approximate aerosol type maps are generated
- Identifying days of severe events (high aerosol loading) during the study period (2003-2014) and identify the aerosols type(s) that characterize these events.

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Nashaat Gad,

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