Exploring the relation between Aerosol Optical Depth and ground-level particulate matter at the Metropolitan Region of São Paulo - Brazil.

Fábio J. S. Lopes[1], Maria F. Andrade[1], and Eduardo Landulfo[2]

[1]*Instituto de Astronomia, Geofísica e Ciências Atmosféricas (IAG) - Universidade de São Paulo (USP), Rua do Matão 1226, Cidade Universitária, CEP 05508-000, São Paulo - SP, Brazil*
[2]*Centro de Lasers e Aplicações (CLA) - Instituto de Pesquisas Energéticas e Nucleares (IPEN), Av. Lineu Prestes 2242, Cidade Universitária, CEP 05508-000, São Paulo - SP, Brazil*
fabiolopes@usp.br

Abstract: High populated regions suffer constantly with elevated concentration of aerosol, which can affect not only the climate but also impair the air quality, bringing several issues to the health of population. The so-called Metropolitan Area of São Paulo (MASP), one of the largest megacities in the world, faces several problems related to the air quality due the high concentrations of aerosols produced either by local sources [1] or by long-range transportations [2]. Concerned with the elevated concentrations of aerosol and their impact in the air quality and the climate changes inside the MASP, this study intend to explore the correlation between the aerosol optical properties and the particulate matter concentration measured by ground-based instruments during the winter campaign conducted between July and September of 2012. AOD products from Moderate Resolution Imaging Spectroradiometer system (MODIS), associated with PMx concentrations measured by University of São Paulo (IAG/USP) air quality station and Environment Agency of São Paulo State (CETESB) were used to obtain such correlation. Information on the vertical structure of the aerosol profile and the planetary boundary layer altitude were achieved using a lidar system in order to improve the AOD-PMx correlation. These results can be used for monitoring air quality, improve air quality model forecast and better address the influence of high aerosol concentration in the climate changes within the context of megacities.

References

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