

EVALUATION OF THE IMPACTS OF STRATOSPHERIC AEROSOLS ON SÃO PAULO AFTER THE 2019-2020 WILDFIRES IN AUSTRALIA (BLACK SUMMER)

Pérola P.Q Lopes¹, Luisa D. Mello¹, Giovanni Souza¹,
Fábio J. S. Lopes², Gregori de A. Moreira³, Eduardo Landulfo¹

¹ Centro de Laser e Aplicações (CELAP), Instituto de Pesquisas Energéticas e Nucleares (IPEN),
Av. Prof. Lineu Prestes, 2242, Cidade Universitária, 05508-000, São Paulo – SP, Brazil

² Department of Environmental Sciences, Institute of Environmental, Chemical and Pharmaceutical Sciences (ICAQF),
Federal University of São Paulo (UNIFESP), Campus Diadema, São Paulo, Brazil.

³ Federal Institute of São Paulo (IFSP), Campus Registro, São Paulo, Brazil

Contact: perolapq@usp.br

Abstract

In August 2019, a series of wildfires erupted in Australia, later termed "Black Summer," rapidly spreading across various states and consuming a total area of approximately 103,000 square kilometers. This study employed the MSP-Lidar I, an advanced remote sensing system, to analyze aerosol disturbances in the stratosphere above São Paulo, with a focus on altitudes ranging from 15–30 km during January 2020. Through lidar measurements at three different wavelengths, we successfully identified and analyzed the vertical dispersion of aerosol plumes. By utilizing atmospheric modeling, HYSPLIT, the study traced the path of these plumes across the Pacific Ocean to São Paulo. The analysis revealed three distinct plumes at specific altitudes, all originating from the regions affected by the Australian wildfires. This research underscores the effectiveness of the MSP-Lidar I in tracking complex atmospheric phenomena and significantly enhances our understanding of the long-term dynamics of aerosol dispersion. These findings are crucial for air quality and global climate change studies, as they underscore the far-reaching transcontinental impacts of large-scale wildfires. The study highlights the urgent need for international collaboration in monitoring and mitigating the effects of such fires on global atmospheric conditions.

Keywords: stratospheric aerosol; Australia Wildfires.

XII WLMLA Topic: Remote sensing of Stratospheric Aerosols

ID: Oral OP-RSSA-08