

## EXPLORING THE IMPACT OF CIRRUS CLOUDS IN SÃO PAULO: LONG-TERM ANALYSIS USING CALIPSO LEVEL 2 DATA

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### Abstract

Cirrus clouds play a role in the greenhouse effect by interacting with the outgoing thermal radiation released by the Earth's surface. There has been a growing interest in studying these clouds in recent decades, and scientists globally have been gathering data on their physical and optical characteristics. Understanding their impact on climate is crucial for improvements in atmospheric models. The positive impact of cirrus clouds on the radiative budget is attributed to their thickness and their ability to allow shortwave solar radiation while blocking longwave radiation emitted from the surface. These clouds have extensive coverage across the globe, particularly in tropical regions, significantly influencing the climate. This study presents an extensive analysis of cirrus cloud characteristics in the São Paulo state region using data collected by the CALIPSO satellite over eleven years (2007-2017). The investigation covers various aspects of cirrus clouds, including their distribution, altitude, thickness, temperature, and optical properties. Yearly distributions reveal prevalent cirrus clouds occurring between 10 and 15 km, with little variations over the years. Monthly distributions highlight seasonal dynamics in base and top altitudes, while cirrus thickness remains relatively consistent. This study explores cirrus cloud optical depth (COD), showing variations across different thicknesses. This research aims to contribute to a deeper understanding of cirrus cloud behavior in South America and its implications for atmospheric processes.

**Keywords:** Cirrus Clouds; CALIPSO; CALIOP.

**XII WLMLA Topic:** Remote sensing of clouds

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