

## Calculating the vertical distribution of aerosol in Central Amazon from the measurements of a ceilometer during GoAmazon IOP1 (Feb-Mar 2014)

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**Abstract:** Aerosols are important for the global climate system and they can significantly alter the planet's energy balance, in time scales ranging from minutes to climate change. There are different types of aerosol and each have different impacts. Some types reflect the solar radiation, cooling the planet, while others absorb this radiation, thus warming the planet. In this sense, it is important to understand how pollution emission may alter the natural distribution of aerosols. The recent GoAmazon2014/15 experiment provided continuous observations with high temporal and spatial resolution over the Amazon rainforest. In this study, our main goal is to study the vertical distribution of aerosols in the central Amazon region in a period when there was no contribution from biomass burning, with data from the experimental site T3-Manacapuru, located downwind of the city of Manaus, which alternatively receives clean air masses from the forest and polluted air masses from the city. The study period is IOP1 (Feb-Mar 2014) of the GoAmazon2014/15 experiment. Only profiles in which there were not detected any clouds will be included in the analysis. Clouds were detected using an automatic algorithm developed in our laboratory. The detection of the aerosols is made by applying the Klett method (Klett, 1981) to the elastic backscatter signal measured by the ceilometer, in order to obtain the vertical distribution of the aerosol backscatter coefficient. We found that it is possible to calculate the vertical distribution of aerosol using a ceilometer if the profiles containing clouds are correctly identified and removed from the analysis and a suitable temporal average is applied to the data.

**Keywords:** aerosol; clouds; Klett.

**IXWLMLA Topic:** \_\_\_\_\_ (list of topics at <http://ciencias.medellin.unal.edu.co/eventos/wlmla/index.php> ).