Title: Cirrus clouds observation in Santa Maria, Rio Grade do Sul during the experiment Chuva – Sul.

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Abstract:

Cirrus clouds are an interesting point in the research of the atmosphere due their behavior and the effect on the earth radiation budget. They can affect the atmospheric radiation budget by reflecting the incoming solar radiation and absorbing the outgoing terrestrial radiation. Also, this cloud type is involved in the dehydration of the upper troposphere and lower stratosphere. So, it is interesting to increment the measurements of this type of clouds from the ground.

During November and December 2012, through the CHUVA-SUL campaign, measurements with lidar in Santa Maria, Rio Grande do Sul were conducted. The system installed in Santa Maria site (29.8 °S; 53.7 °W, 100 m asl) was a single elastic-backscatter lidar using the wavelength of 532 nm. Some days with cirrus clouds lidar measurements were detected. Four days with presence of cirrus cloud are showed in the present study. These days, 7, 8, 19 and 28 November 2012, was selected due the persistence of cirrus clouds over many hours.

The raw retrieval lidar signals and inverted backscatter coefficient profiles were analyzed for the selected days. Base and top height was obtained by analysis of raw signal and backscatter coefficient. Extinction coefficient profiles were obtained by the assumption of the lidar ratio. Cirrus cloud optical depth (COD) values were calculated, from the integration of the extinction coefficient between the base and top altitudes of the cirrus clouds.