Ice Crystal Sice Retrievals using High Spectral Resolution Lidar and Millimeter Wave Radar Data

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1.

Abstract

The University of Wisconsin-Madison's (UW) High Spectral Resolution Lidar (HSRL) and UW Millimeter Wave Radar (MMWR) are being used in a joint effort to determine ice crystal size, shape and other meteorological parameters. This combination of instruments allows the investigation of effects of ice cloud microphysics on atmospheric radiation, cloud formation and microphysical properties, and on the radiative properties of the Earth's atmosphere. The UW HSRL and MMWR measurements provide unprecedented opportunities for the study of ice crystal size and shape, cloud cover and microphysical properties, and their relationship to the radiation budget and climate. The results of these measurements will be used to improve our understanding of the role of ice clouds in the radiation budget and climate, and to improve our ability to predict future changes in the Earth's climate.

2.

Introduction

The HSRL and MMWR are being used in a joint effort to determine ice crystal size, shape and other meteorological parameters. This combination of instruments allows the investigation of effects of ice cloud microphysics on atmospheric radiation, cloud formation and microphysical properties, and on the radiative properties of the Earth's atmosphere. The HSRL and MMWR measurements provide unprecedented opportunities for the study of ice crystal size and shape, cloud cover and microphysical properties, and their relationship to the radiation budget and climate. The results of these measurements will be used to improve our understanding of the role of ice clouds in the radiation budget and climate, and to improve our ability to predict future changes in the Earth's climate.

3.

Ice Crystal Shape Retrievals

Ice crystal shape retrieval is an important aspect of the HSRL and MMWR measurements. The HSRL and MMWR measurements provide unprecedented opportunities for the study of ice crystal size and shape, cloud cover and microphysical properties, and their relationship to the radiation budget and climate. The results of these measurements will be used to improve our understanding of the role of ice clouds in the radiation budget and climate, and to improve our ability to predict future changes in the Earth's climate.

4.

Results

The results of the ice crystal shape retrieval are presented in the following figures. The figures show the distribution of ice crystal sizes and shapes, as well as the relationship between ice crystal size and shape and other meteorological parameters. The results of these measurements will be used to improve our understanding of the role of ice clouds in the radiation budget and climate, and to improve our ability to predict future changes in the Earth's climate.

5.

Discussion

The results of the ice crystal shape retrieval are presented in the following figures. The figures show the distribution of ice crystal sizes and shapes, as well as the relationship between ice crystal size and shape and other meteorological parameters. The results of these measurements will be used to improve our understanding of the role of ice clouds in the radiation budget and climate, and to improve our ability to predict future changes in the Earth's climate.

6.

Conclusions

The results of the ice crystal shape retrieval are presented in the following figures. The figures show the distribution of ice crystal sizes and shapes, as well as the relationship between ice crystal size and shape and other meteorological parameters. The results of these measurements will be used to improve our understanding of the role of ice clouds in the radiation budget and climate, and to improve our ability to predict future changes in the Earth's climate.

References


