

# Japan Geoscience Union Meeting 2011

(May 22-27 2011 at Makuhari, Chiba, Japan)

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MIS024-P01

Room:Convention Hall

Time:May 25 10:30-13:00

## Could properties and the effect on climate

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The existence of clouds causes great uncertainty for predicting the climate change. Clouds reflect the solar radiation to cool the earth-atmosphere system, while they absorb the infrared radiation from the system to heat it. The net effect on climate depends on cloud properties such as optical characteristics, cloud cover rate, and cloud height. Since these cloud properties are determined through the microphysical processes of a few micron-scale cloud droplets, it is difficult to estimate net cloud effect precisely. Also, according to the recent hypothesis that galactic cosmic rays at the earth affects microphysical process, the cloud properties are the key to understand the climate, especially to understand the mechanism that connects cosmic phenomena and climate. In this study we numerically estimate the effect on climate as induced by the variation of parameters that affect optical characteristics, such as droplet radius and liquid water contents. We also evaluate the effect of macro parameters, such as cloud cover rate and cloud height. As a result, it is found that the optical characteristics do not significantly affect climate. We therefore conclude that the cloud cover rate is a dominant factor for the climate change by cosmic ray intensity variation.

Keywords: Cosmic ray, Cloud, Climate, Modeling