Ground based observation of sky conditions for understanding the properties of the direct and diffuse PARs

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The solar radiation is the origin of energy on the ground surfaces. Photosynthetic Active Radiation (PAR) is almost equivalent in visible wavelength from 400nm to 700nm. PAR is one of the important environmental factors to understand CO2 flux and the photosynthetic production. However, PAR is controled by the weather condition especially caused by cloud existence. Even in the case of the fair weather, the cloud cover varies and makes the different value of PAR. Therefore, in order to estimate PAR in all weathers, it is necessary to observe various sky conditions corresponding to cloud type varieties. Clouds observation has been depended on the observer's eyes and experiences. And it has been performed at several times per a day so far. Thus, there is the limitation to use the data about the sky conditions, and it is difficult to clarify the effects of clouds existence for the direct and diffuse PARs.

From such a background in this study, we foucus on the sky conditions formed by cloud existence and its effects for the properties of direct and diffuse PARs on the ground surfaces. The purpose of this study is to clarify the properties of the direct and diffuse PARs infulenced by sky conditions. This study proposes the method how to discriminate ths sky conditins continuausly by the ground based observation usinng whole sky camera in order to estimate the relationship between sky conditions and direct/ diffuse PARs and the effects of clouds existence.

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