

## The Effect of Land Surface Condition on Convective Precipitation over the Mountainous Region in Japan during the Summer Season

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In this study, the effect of land cover on convective precipitation in mountainous region in Japan on 15th Aug. 2001, during the IOP of the Lake Biwa Project is investigated by numerical simulations. The ARPS, which has been developed by University of Oklahoma, coupled with a land surface process model SiBUC, which has been developed by Kyoto University, is used in this study.

Firstly, a numerical simulation with 1.5km horizontal spacing, which has actual land cover, is carried out and it is called CASE1. Secondly, a numerical simulation with the same horizontal spacing, which has imaginary land cover (forest is changed into paddy field), is carried out and it is called CASE2.

In Fig.1, significant reduction of rainfall over the mountainous region around the Lake Biwa can be seen in simulation of CASE2. This may be explained that the buoyant stability over the mountainous area is lager in CASE2 than CASE1 because near surface potential temperature is smaller and precipitable water is also smaller over mountainous area in CASE2 than CASE1. This may be explained that surface heating and transportation of water vapor by local circulation induced by surface heating is smaller in CASE2 than CASE1.

It is, therefore, indicated that the difference of land surface condition, such as land cover, can affect the amount of rainfall over the mountainous region in Japan on summer sunny days.

Keywords: Land cover; local circulation; convective precipitation.



Figure 1: Accumulated rainfall for 12JST - 18JST on 15th August 2001 with (a) Radar AMeDAS observation, (b)CASE1, (c)CASE2. The terrain heights of 0m and 500m are indicated by the thick and thin contours.