



## A Mountain Glacier Scheme for Regional Climate Model and Its Preliminary Results

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As an important inland freshwater resource, mountain glacier is highly related to human life, and playing a very important role in regional water cycles. Contemporary regional climate models (RCMs) give a simplified representation, which describes the mountain glacier as a static land mask, without considering ablation and accumulation. In this study a mountain glacier scheme was developed for RCM. This new scheme includes the following characteristics: (1) thermodynamics of glacier, including the metamorphism and densification of snow cover, and the transformation from snow to glacier; (2) a fine mesh nested in RCM horizontal grid to match the highly non-uniform spatial distribution of the mountain glacier; (3) revised radiation flux reaching the glacier surface according to the surrounding terrain. The mountain glacier scheme was coupled to the MM5-based regional climate model (CMM5) and used to study mountain glacier in China. The simulation results showed a reasonable spatial pattern on glacier melting. The fine-mesh strategy improved the model and was able to distinguish the ablation difference between the south and north aspect of the mountain within a single RCM grid. Different ablation/accumulation curves appeared on glaciers under different climate conditions and geographical location. Further study is underway to investigate mountain glacier response to the different IPCC climate projection scenarios in China.