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Investigation of the Effects of Urban Heating on the Heavy Rainfall Event by a Cloud Resolving Model CReSiBUC

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Synopsis

In this study, effects of urban heating on the development of the heavy rainfall on 21 July 1999 in Tokyo (the Nerima heavy rainfall) were investigated by a coupled model of a cloud resolving model CReSS and a precise land surface model SiBUC (CReSiBUC). Four numerical simulations were carried out for this rainfall event. The first simulation had realistic land cover, second one had imaginary land cover (urban area was changed into paddy field), the third one had imaginary land cover (urban area was enlarged) and forth one had realistic land cover and imaginary anthropogenic heat. From those simulations, it was found that changes of distribution of urban and anthropogenic heat amount greatly affected on the positions and amounts of rainfall.

Keywords: urban heat island, heavy rainfall, cloud resolving model, CReSiBUC

雲解像モデルCReSiBUCによる都市の加熱が豪雨に及ぼす影響の検討

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要　旨

本研究では、1999年7月21日に発生した練馬豪雨を事例として取り上げ、都市の加熱が降水に及ぼす影響を、詳細な陸面過程を組み込んだ雲解像モデルCReSiBUCを用いて検討する。土地利用分布や人工排熱量を変化させた4種類の感度実験の結果から、都市の加熱に伴う強い収束が、水蒸気のより大きな集中化を招き、短時間・局所的な強雨現象の形成位置や水平規模に影響を与えていることが示唆された。

キーワード:ヒートアイランド，豪雨，雲解像モデル，CReSiBUC