

综述与评述

日以下尺度降雨随机模拟研究进展

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摘要:

目前我国作物生长、土壤侵蚀等应用模式发展很快,利用这些模式进行气候变化影响评价的研究逐渐成为热点,但日以下尺度降雨观测资料却严重不足,迫切需要针对我国复杂的气候条件建立日以下尺度降雨模拟模型,为应用模式提供更为精细的降雨资料输入。重点从次降雨事件的划分方法、次降雨事件模型的模拟过程、Bartlett Lewis和Neyman Scott点过程模型的模拟过程、参数估计、参数敏感性分析以及模型改进等方面综合概述了日以下尺度降雨随机模拟的进展,同时给出这几种模型的对比研究结果,从而为人们根据不同目的和条件选择不同模型提供借鉴。最后指出,结合点过程和次降雨事件等方法优点的混合模型——基于天气分型的随机模拟模型以及将统计与动力方法相结合的模拟模型,可能是未来降雨模拟的重要发展方向。

关键词: 降雨;随机模拟;日以下尺度;次降雨事件方法;点过程方法

Review of Stochastic Simulation of Sub-daily Scale Precipitation

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Abstract:

The sub-daily scale precipitation simulators are necessary for earth surface process models, for they can provide these models with more detailed rainfall data which are not widely available currently. In this review, focus was placed on two kinds of stochastic simulation techniques: Storm-based (Event based) model and Poison cluster model. Firstly, criteria on how to define a storm and the development of storm-based simulation model were introduced. Secondly, several aspects of Bartlett-Lewis and Neyman-Scott poison cluster models were reviewed, including model structure, model fitting, parameter sensitivity analysis and model improvement. Then, comparison researches on stochastic models' behavior were also summarized to provide some information on how to choose proper simulation model based on application purposes. Finally, it was pointed out that the prospects of stochastic simulation were as follows: integrating advantages of storm-based model and poison process model; developing weather-type conditioned simulation; and combining statistical and dynamical downscaling techniques.

Keywords: Precipitation Stochastic simulation Sub-daily scale Storm-based stochastic model Poison cluster model.

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