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Hydrology and Earth System Sciences Discussions

Interactive comment on "Downscaling of daily precipitation with a stochastic weather generator for the subtropical region in South China" *by* Y. D. Chen et al.

Anonymous Referee #1

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General Comments:

This is a very valuable paper; it is a mathematically rigorous study of a region lacking similar work (rainfall modelling), yet with increasing water resources pressures due to the rapid economic development. I recommend this paper for publication.

Specific Comments:

(1) The prediction of daily rainfall by Markov chain models or indeed the downscaling procedures used are not new, however, their application to the critical region of South China is new and the methods have been applied competently.

(2) The raingauge network used to derive the interpolated surface shown in Fig. 4 is sparse within the central region of the plot (see Fig. 1). Consequently, the 'spotty' spatial pattern presented (particularly in the vicinity of the Fogang raingauge) is strongly affected by raingauge location. Some acknowledgement of this should be made within the text or figure caption.

(3) The under-prediction of the rainfall variance by stationary Markov chain models has been shown elsewhere. The authors might consider acknowledgement of studies that use non-stationary transition probabilities to address this problem.

(4) Some acknowledgement (perhaps in the conclusions) of the considerable errors in the simulation of monthly rainfall totals by current GCMs (including HadCM2) needs to be made. These are errors in estimated values compared with historical global rainfall observations (Legates and Willmott, 1990; Xie and Arkin, 1996), and not the forecast errors.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 3, 1145, 2006.