CORRESPONDENCE

Comments on "Stochastic Models for Monthly Rainfall Forecasting and Synthetic Generation"

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Delleur and Kavaas (1978) have fitted ARIMA models to the average monthly rainfall time series over 15 basins. Based on the Portmanteau test, it is concluded that the (1,0,1) B-J model can be used for forecasting and generation of cyclicly standardized time series over all the 15 basins. However, different order B-J models may pass through the Portmanteau test for the given series and yet all of them may not give equally good forecasts. Therefore the writers feel that Akaike's information criterion as developed by Ozaki (1977) should be used for choosing or comparing the models instead of the Portmanteau test.

Square-root transformation has been used in the analysis of rainfall data. It is highly unlikely that this transformation will render all the series normal. The choice of a proper transformation is of critical importance in B-J modeling. For example, Chatfield and Prothero (1973) could not get a satisfactory forecast by using log transformation. Tunnicliffe-Wilson (1973) pointed out that a wrong or overtransformation introduces bias in the forecast, while the model may still pass the χ^2 test. It was suggested that a more flexible parametric family of transformations, introduced by Box and Cox (1964) for the fixed effects analysis of variance models, could be used to improve forecasting performance. The family is given by

$$y_\lambda(t)=\begin{cases}\dfrac{y^\lambda(t)-1}{\lambda}, & \lambda\neq 0\\ \ln y(t), & \lambda=0.\end{cases}$$

It may be noted that square root and log transformation correspond to $\lambda=0.5$ and 0.0 in the above transformation.

Ansley *et al.* (1977) have developed an efficient algorithm for the estimation of λ along with other parameters in an ARIMA model. Hinkley (1977) has used this transformation for monthly rainfall series, whereas Chander *et al.* (1978) have applied it for flood frequency studies with good results.

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