

Interactive comment on “Rainfall nowcasting by at site stochastic model P.R.A.I.S.E.” by B. Sirangelo et al.

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Received and published: 16 April 2007

We thank the editor for his comments on our paper. We consider the comments as very useful and below we provide the answers to the questions raised. Reply on the specific comments: 1. As regards the hypothesis of weak (i.e. second order) stationarity, it is not possible, because of the present hourly rainfall sample size, to identify a suitable typology of non-stationarity and then to carry out a parameter estimation with small uncertainty. For this reason, we use a stationary model, and his application is referred to the rainfall data measured during the “rainy season” 1 October - 31 May; in this period correlation structure, mean and variance of the sample appear significantly homogeneous (see De Luca, D. L.: Metodi di previsione dei campi di pioggia. Tesi di Dottorato di Ricerca, Università della Calabria, Italy, 2005). 2. The model was validated against more observed rainfall events than two ones illustrated in fig. 5, 6 (exactly 100

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events out of about 10000 ones), and in the revised paper we will summarize results of validation by the all tested events. Moreover, the rainfall events utilized for validation test (chosen in random way) aren't also used for model calibration; the number of these constitutes a small part of the whole ensemble of rainfall events and, consequently, their exclusion for model calibration doesn't modify parameter estimation. 3. As regards the chosen threshold value ($=0.025$) for estimating the correlation length, it is evaluated by generation of time series using autoregressive models of order equal to the correlation length, and considering the 95 % confidence interval of the sample maximum absolute scattering (see eq. 3 at page 155). Nevertheless, using autoregressive models appears unsuitable for the rainfall feature, and it cannot be used as statistical test. For every analyzed raingauge, the sample partial autocorrelogram is less than the chosen threshold value for a lag greater than 8 hours. Nevertheless, from one to another raingauge, sample partial autocorrelation values are different, mainly for the first lags, so the estimated parameter τ results different among them. 4. In the revised paper we will show temporary changes of the parameters (for Cosenza Raingauge) over subperiods of the "rainy season". Nevertheless it must be highlighted that the reduction of sample size entails greater uncertainty for parameter estimation. This is contrasting, as written in our first answer, with need of preserving a suitable sample size. 5. In the revised paper we will modify the Introduction following his advices. 6. Following the advice of the editor, we will cut down the description of the partial autocorrelation calculation (section 2.1) substituting it with reference.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 4, 151, 2007.

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