The title (العنوان):

Assessment of prediction performances of stochastic
models: Monthly groundwater level prediction in
Southern Italy

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Abstract : Stochastic modelling of hydrological time series with insufficient length and data gaps is a serious challenge since these problems significantly affect the reliability of statistical models predicting and forecasting skills. In this paper, we proposed a method for searching the seasonal autoregressive integrated moving average (SARIMA) model parameters to predict the behavior of groundwater time series affected by the issues mentioned. Based on the analysis of statistical indices, 8 stations among 44 available within the Campania region (Italy) have been selected as the highest quality measurements. Different SARIMA models, with different autoregressive, moving average and differentiation orders had been used. By reviewing the criteria used to determine the consistency and goodness-of-fit of the model, it is revealed that the model with specific combination of parameters, SARIMA (0,1,3) (0,1,2) 12, has a high R2 value, larger than 92%, for each of the 8 selected stations. The same model has also good performances for what concern the forecasting skills, with an average NSE of about 96%. Therefore, this study has the potential to provide a new horizon for the simulation and reconstruction of groundwater time series within the investigated area.

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