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A non-linear neural network technique for updating of river flow forecasts

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Abstract. A non-linear Auto-Regressive Exogenous-input model (NARXM) river flow forecasting output-updating procedure is presented. This updating procedure is based on the structure of a multi-layer neural network. The NARXM-neural network updating procedure is tested using the daily discharge forecasts of the soil moisture accounting and routing (SMAR) conceptual model operating on five catchments having different climatic conditions. The performance of the NARXM-neural network updating procedure is compared with that of the linear Auto-Regressive Exogenous-input (ARXM) model updating procedure, the latter being a generalisation of the widely used Auto-Regressive (AR) model forecast error updating procedure. The results of the comparison indicate that the NARXM procedure performs better than the ARXM procedure.

Keywords: Auto-Regressive Exogenous-input model, neural network, output-updating procedure, soil moisture accounting and routing (SMAR) model

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