

Doutorado (DO)

A NEW PERSPECTIVE ON THE BRAZILIAN STREAMFLOW FORECASTING: EVIDENCE FROM CLIMATE EFFECTS

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ABSTRACT

In a recent paper, the authors applied Dynamic Linear Models (DLM) to forecast Brazilian reservoir streamflows using climate variables. The results shown the many benefits by inserting external information in the hydrological scenarios generation. This paper proposes new approaches in order to further improve the results published in the literature. For this purpose: (i) the innovative so called Periodic Generalized Additive (PGAM) Model is introduced; (ii) the Periodic Autoregressive Models with one exogenous variable (PARX) is applied; and (iii) hybrid models are designed, considering decomposition techniques known as Singular Spectrum Analysis (SSA) and Multichannel-SSA in combination with the Periodic Autoregressive (PAR) Model. When compared to the current model used for hydrological scenarios generation, the results shown superior performance for all basins. When confronted with the results obtained via DLM, it was possible to improve the performance of, at least, seven basins.

Keywords: Streamflow - Hybrid models - SSA - PARX - PGAM

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