Model Diagnostics in the CAPTAIN Toolbox

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The CAPTAIN Toolbox for Matlab provides many routines for time series analysis and statistical evaluation, most of which are useful for the diagnosis of hydrological models. These routine can be categorized in three groups: fairly standard statistical measures and tests, such as model order identification statistics; recursive estimation algorithms for time variable and state dependent parameter estimation, the latter allowing for the identification and parameterization of omitted nonlinearities in hydrological models; and other tools used in Data-Based Mechanistic (DBM) Modelling, including routines for large model emulation that allow the modeller to identify and investigate the dominant dynamic modes and behaviour of a large hydrological computer model. This paper will outline some of these routines and demonstrate their utility in a hydrological context.