Geophysical Research Abstracts,
Vol. 11, EGU2009-8721, 2009
EGU General Assembly 2009

Forecasting river level using Data Based Mechanistic models and online data assimilation

P.J. Smith, D.T. Leedal, K.J. Beven, W. Tych, and P.C. Young
Lancaster Environment Centre, Lancaster University, United Kingdom (p.j.smith@lancs.ac.uk)

The parsimonious time series models used within the Data-Based Mechanistic modelling framework are readily transferred into a State-Space form allowing the implementation of data assimilation using the Kalman filter. Multiple case studies have demonstrated the effectiveness of this framework in providing probabilistic forecasts in many hydrological situations. Recent work on the prediction of water levels during flood events, summarised here, has utilised heteroscedastic formulations for the observational noise covariance matrix in the Kalman filter. This is extended to include heteroscedastic formulations for the state evolution noise covariance matrix. Such a formulation allows the recognition of the fact that the structural error of the model may relate to model state or input. We demonstrate these techniques using case studies from UK rivers.