Geophysical Research Abstracts,
Vol. 11, EGU2009-9294, 2009
EGU General Assembly 2009

Uncertainty estimation in rainfall interception modelling

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The uncertainties in model input data and parameters values are rarely taken into account in rainfall interception modelling. Similarly, the necessary validation of the model with a split dataset is not always possible. Measurement and modelling are always prone to errors, requiring that the uncertainty estimation of data, parameters and model output will be done for a reliable quantification of rainfall interception. The objective of this work is to study the uncertainty of rainfall interception estimation at the plot and event scales, followed by the application of the Generalized Likelihood Uncertainty Estimation (GLUE) method to the Rutter rainfall interception model, with the aim of estimating the predictive uncertainty associated with this model.
Standard errors of the measured precipitation, throughfall and stemflow were used to estimate the measurement uncertainty bounds of calculated rainfall interception.
First, the Rutter model was run with a single set of parameters derived from measured data and the output was plotted together with the calculated uncertainty bounds of measurements to analyse the primary goodness of model prediction. Subsequently, different parameter sets were used to run the model and predicted and measured data were examined. However, each set of parameters, with different storage capacities and evaporation rates, resulted in simulated events with different duration, making it difficult to compare each model run with measured data. Some options to overcome this problem are tested and discussed.