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Hydrology and Earth System Sciences Discussions

Interactive comment on "Model based on dimensional analysis for prediction of nitrogen and phosphorus concentration in the River Laborec" *by* M. Zeleňáková et al.

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The paper: "Model based on dimensional analysis for prediction of nitrogen and phosphorus concentration in the River Laborec"presents a model for pollutant concentration – nitrogen and phosphorus prediction in a stream based on a dimensional analysis. It investigates how dimensional analysis can be applied to water quality modelling. This is an interesting paper in that it potentially offers a simple way of deriving the equations for a model. It is not new but the way the method is employed is instructive. It also saves the problem of deriving causal relationships. The manuscript represents a substantial

contribution to scientific progress within the scope of HESS Journal. The scientific approach and applied methods are valid. The results are discussed in an appropriate and balanced way including appropriate references. In the section on material and methods is described the measured values as variables, an important distinction in dimensional analysis. Air temperature is not a variable that is obviously related to N concentration in the stream and it does not appear in equation 2, yet it is introduced with exponent x6 in equation (3) to form the dimensionless ratio with water temperature. It is necessary to complete air temperature to equation (2). In view of the simplistic inference and the haphazard fit, how can we be sure you have chosen the correct variables for the dimensional analysis? There are possibly some other, equally important variables that should be included. Some discussion on the significant variables you may include in the paper. The scientific results and conclusions are presented in a clear and concise way.

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