



Modelling a karstic aquifer with a mixed flow equation

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The flow in karstic conduits is well known to be non laminar. For that reason the Darcy-Weisbach, or other non linear, equation is often used for modelling karstic aquifers. However the flow in the conduit system is not always pressurized. During the dry season the flow in some of the conduits may be conducted with free surface conditions. In this case a formula derived from open channel hydraulics may be more suitable for modelling the karstic aquifer. A mixed flow equation that is suitable for both pressure flow and free surface flow is presented in this study along with a case study in the intensively karstified aquifer of Bregava spring in Bosnia. The case study showed that the mixed equation improved significantly the model performance especially as far as the simulated water level is concerned.