SENSITIVITY ANALYSIS OF SELECTED INPUT PARAMETERS OF THE NUMERICAL MODEL HEC-RAS IN AND FLOODPLAIN FLOW CALCULATIONS

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In current engineering practice, hydraulic calculations of water flow in open channels and floodplains are performed primarily using 1D, 2D and coupled 1D/2D numerical models. In the case of the mentioned 2D schematization, the mathematical model is usually based on the so-called shallow water equations. In this context, the turbulence models with different concepts of turbulence modeling are used to mathematically describe turbulent flow. At present, the HEC-RAS software, which uses a turbulence model based on the Boussinesq approximation, is relatively widespread for the purposes of hydraulic calculations. The aim of the paper is to present the results of sensitivity analysis taking into account the influence of the input parameters of the turbulence model on the results of hydraulic calculations in the case of using 2D schematization or in the use of coupled 1D/2D model. The analyzes also include verification of the possible influence of the results by changes in other parameters of the calculation, which include, for example, the use of diffusion wave approximation or the method of spatial discretization of the solved region. For verification calculations, a fictitious reach with a trapezoidal cross-section was selected, as well as a real section of the Svratka river in the city of Brno in the length of approximately 2.6 km. The purpose of this paper is to provide a basic idea of the uncertainties arising from the choice of selected input parameters for potential users of 2D numerical models.