

## **Truncation errors of selected finite difference methods for two-dimensional advection-diffusion equation with mixed derivatives**

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### **A b s t r a c t**

The spread of a passive contaminant in an open-channel reach is considered with use of a two-dimensional advection-diffusion equation with the included off-diagonal dispersion coefficients. This paper presents the calculation of truncation errors, namely numerical diffusion and numerical dispersion for various finite difference schemes. The accuracy of the considered finite-difference approximations is analysed by deriving and studying the relevant modified partial differential equation.

**Key words:** truncation error, numerical diffusion, numerical dispersion, Modified Equation approach, advection-diffusion equation.