

## ***Interactive comment on “The backward Itô method for the Lagrangian simulation of transport processes with large space variations of the diffusivity” by D. Spivakovskaya et al.***

**D. Spivakovskaya et al.**

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We are grateful for E. LaBolle for his comments and advice regarding the paper.

- **Interpolation as an Alternative.. “ . . . It would be helpful if the authors were to mention these alternative approaches to solving these problems where the dispersion tensor appears discontinuous (see LaBolle, E.M., G.E. Fogg, and A.F.B. Tompson, Random-Walk Simulation of Transport in Heterogeneous Porous Media: Local Mass-Conservation Problem and Implementation Methods, *Water Resour. Res.*, 32(3), 583-593, 1996).”**

We are grateful to the referee for his valuable comment and we included the

corresponding remark into the paper..

- **Terminology.** “The application of stochastic calculus assumes a priori that the parameter fields are smooth. For discontinuous coefficients, the usual stochastic calculus does not apply. Thus, rather than use the term ”backward Ito“ (BI), I would instead use the term ”generalized SDE“, ”generalized BI“, or something similar. . . ”

The problem of the convergence of the backward Ito random walk model is very important, especially if we want to extend the results for other applications and for two- or three-dimensional problems. From mathematical point of view the term “generalized BI” random walk model is more suitable. In our opinion the usage of the term “generalized BI” random walk model to distinguish the difference between SDE with continuous and discontinuous diffusivity term will make the paper mathematically more complex and we prefer to use the term “backward Ito“. However, we agree that the problem of convergence is very important and we have included a discussion in the paper.

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Interactive comment on Ocean Sci. Discuss., 4, 623, 2007.

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