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Reply to the comment on the article "An effective particle tracing scheme on structured/unstructured grids in hybrid Finite Volume/PDF Monte Carlo methods" by G. Li and M.F. Modest [J. Comp. Phys. 173 (2001) 187–207]

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We would like to thank the authors for their comments. After rechecking the scheme, we agree that as used the scheme is only first order accurate for constant density flows, and will produce a spurious drift for variable-density flows.

It was not our intention to devise a new integration scheme for stochastic differential equations in our paper. The predictor/corrector scheme was initially taken from [11] and modified with the intention to keep it consistent with the stochastic differential equations for the composition PDF method. As pointed out, this is not true for variable-density flows. The motivation of using a predictor/corrector scheme was to reduce the statistical error in Monte Carlo simulations. It was found in our study that such a predictor/corrector scheme, although only first order accurate, gives much smaller statistical error than the conventional Euler scheme.

Two test problems were discussed in our paper. The first one involves only constant density and, thus, numerical results for that problem are not affected by the inconsistency. We repeated the simulation for the second problem after correcting the scheme according to the comment's guide lines and found, even for this variable-density problem, results for the Favre-averaged quantities change insignificantly, apparently because the spurious drift is very small as compared to the statistical error in the Monte Carlo simulation. Moreover, the focus of our paper was to propose an effective particle tracing method, which has two key components: adaptive time step splitting and particle splitting and combination. The method itself and all discussion of it remain valid.

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