

Interactive comment on “A Lagrangian Stochastic Model for the concentration fluctuations” by L. Mortarini and E. Ferrero

Anonymous Referee #1

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In this paper, the authors consider the problem of relative dispersion of particle pairs in a homogeneous isotropic and stationary turbulent field. This work extends a previous work from the same authors to the 2D and 3D case. The equations for relative separation and centre of mass are derived, and the numerical solution is compared with the results from the Taylor theory of Lagrangian dispersion, extended to relative dispersion, and with experimental data. An important advantage of this approach is the ability to include second-order chemical reactions, though a unique solution for the Fokker-Planck solution does not exist, in the 1D case and isotropic turbulence.

The paper addresses a relevant scientific question within the scope of ACP. The overall presentation is well structured and clear, the mathematical formulas, figures and

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references are appropriate and well structured. The only substantial comment concerns the discussion section. Since, the theoretical background is not firmly based, it may be important to discuss the strengths and limitations of the theoretical predictions reported in the text (equations 8 and 10). The model does not seem to match the second limit form of equation 10. Can the authors comment on that? Moreover, a deeper insight into the PDFs proposed by Thomson and Richardson (equations 11 and 12) is preferable.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 3621, 2005.

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