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Interactive comment on "Transient residence and exposure times" *by* E. J. M. Delhez

Anonymous Referee #2

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General comments:

In this manuscript the adjoint method previously introduced by Delhez and co-workers to calculate the residence time of a water parcel is extended to estimate the uncertainty of unknown initial conditions (of the backward integration). The residence time is of great importance for environmental applications. The presented theory has the advantage that it does not rely on the assumption of steady state, and diffusion is taken into account explicitly. Further, in the manuscript the ‘‘exposure time" is introduced which measures the total time of a water parcel in the control domain, i.e. the water parcel may re-enter the control domain. The manuscript is very interesting and should be published as it is.

Technical corrections:

Page 248, line 14: ... as the time taken ...

Page 261, line 2 (reference Delhez et al.): Residence time in a semi-enclosed domain

...

Interactive comment on Ocean Science Discussions, 2, 247, 2005.