

Interactive comment on “Transient residence and exposure times” by E. J. M. Delhez

J. Huthnance (Editor)

j.m.huthnance@pol.ac.uk

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The paper makes sufficient advance on a subject of interest to be basically publishable. I think a little work should be done to make it more appealing.

It might start with a couple of sentences of motivation, presently limited to the Abstract and a rather implicit statement at the end of the first paragraph. Pollutant dispersal and residence in a suitable habitat might be mentioned, for example.

It would also seem logical to meet the comment of Referee #1 about lack of a “real-world” example by referring to Delhez et al 2004 and the effect of initialisation and boundary conditions in the Channel and Southern North Sea case therein. Whatever the example, I would not ask for a very detailed calculation but one where a marine scientist might actually be interested in the answer in days or months would add to the interest in the paper (and the journal). The present paper is overall very “dry”. Ideally the example might also contrast the fallacious residence time (23) with correctly

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calculated times.

I would keep the last paragraph on the basis that dead-ends and fallacies should be recorded as such in the literature to save others wasting time later. However, this paragraph ought to end with a sentence that is self-explanatory - to the effect that (23) might be tempting but is not a valid calculation for residence time. Moreover, the paper would better end more conclusively with a positive statement - maybe by some rearrangement of the “Final comments”.

Some minor corrections or improvements are needed.

Page 248 line 14: “.. as the time taken”

Line19 “.. assess ..”

Line 20 “.. tracer parcels ..”

Line 24 “.. tracer in the control region at the time”

Page 252 lines 12, 13 - reverse brackets

Line 18 “initial” time $T = 3T$; (the latter is script T). This needs to be pointed out in the text (not just shown in the figure) so that the logic between page 253 lines 8 to 9 etc. is apparent.

Page 255 line 3 “.. choose ..”

Page 257 line 3 omit tau from the integrand

Page 257 line 18 and page 258 line 3 - reverse brackets.

Page 261 line 3 “.. time in a semi-enclosed ..”

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