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Interactive comment on "Local finite time Lyapunov exponent, local sampling and probabilistic source and destination regions" *by* A. E. BozorgMagham et al.

C. Harrison (Referee)

chsharrison@gmail.com

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This manuscript uses a very clever technique, associating small differences in sampling time with initial spatial separation, to extract a local finite time Lyapunov exponent (FTLE) from realistically accomplished local sampling data. The manuscript then details applications of this method to measuring atmospheric dispersal and designing operational experiments to optimally test for wind-born microorganisms. Finally the results are extended with a stochastic model to examine source and destination regions. As the latter is outside of my expertise, I will restrict my review to the FTLE portion of the manuscript.

The development of a locally defined FTLE is a very nice innovation with many potential applications, for example in oceanography and limnology, as well as smaller scale experimental or biological flow applications. The mathematical development is exceptionally clear and easy to fallow, well supported by the figures, and should be accessible to a wide audience. The applications are well-motivated and made clear by the provided figures. Literature is well-cited and includes a diversity of interesting references. Overall, I find this to be a very good contribution, and only have minor technical/typo suggestions for improvement.

Minor editing issues:

p 908 line 4 Parentheses around citations are needed.

p 910 line 21 "equal" not "equals"

p 911 line 1 "Figure 3 shows" would be less awkward

p911 line 25 "Figure 4b shows"

p 912 line 6 "upper-left" is incorrect

Interactive comment on Nonlin. Processes Geophys. Discuss., 2, 903, 2015.