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Discussions

# Interactive comment on "Riding on the fast lane: how sea turtles behave in post-nesting migration" by Y.-H. Wang et al.

**Y.-H. Wang et al.**

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Thanks for the suggestions. We checked the drifter data that there was no veered off east drifter passing LanYu in the same time periods of the turtle migration (two drifters passed west of LanYu heading straight NE along with Kuroshio main current in September 2010. No drifter was available during September-October 2012). We will include this discussion onto next draft of manuscript, and the reference Fossettle et al. (2012).

In terms of statistical analysis, the drifter data can be used to compute to the standard error of the mean velocity, that is very small and can hardly be seen in the vector plot figure. Attached (Fig. 1) is another plot, more meaningful, which represents the variance ellipses along the principal axis, a quantity related to the standard error of the

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mean. The long side of the ellipse is proportional to the maximum variance, while the short side is proportional to the minimum variance. The major axis is therefore representing the preferred direction of variability of the flow (which is also roughly aligned with the KC). In turn, this also implies that is more likely to find significant departure from the mean drifter's velocity along the direction of the KC than across it. (LC)

Given the lack of Lagrangian data, the drifters cannot be of much help to construct confidence interval but the model is. We tested the probability of turtles that may drift to the foraging site without swimming by 'numerical lagrangian drifters' setting 11x11 drifters 0.1 degree (10km) apart centered at LanYu. A total of 4477 drifters were released in 5-day time interval from May to October 2010 (note that the numerical model resolution is 9 km). The resulting statistics (Fig. 2) show that there is less 1% (45 drifters out of 4477) of drifters may reach the Ishigaki which is the foraging site of the three turtles in this study. Other combinations of numerical drifter settings were also tested (not shown), and chances of drifter may reach the Ishigaki are all small. (YHW)
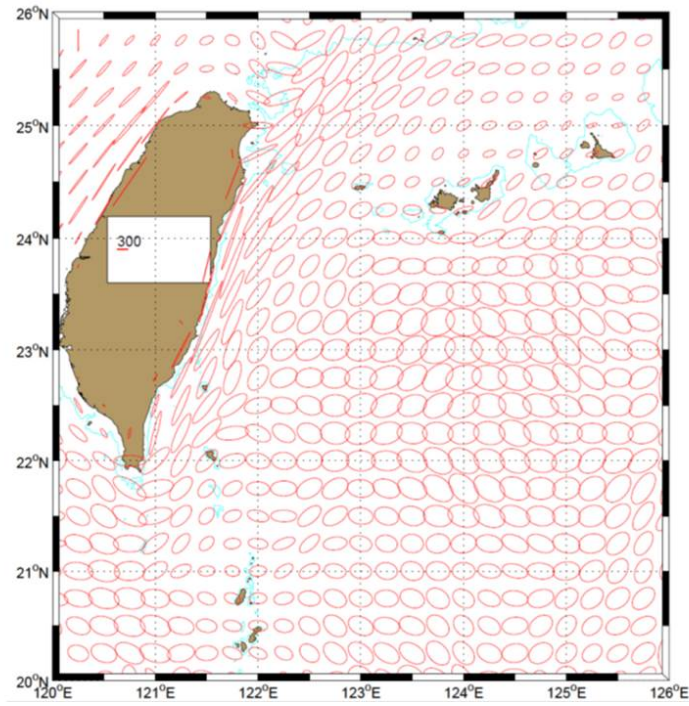
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**Fig. 1.** Errors of the mean velocity based on drifter data 2001-2011. The long side of the ellipse is proportional to the maximum variance, while the short side is proportional to the minimum variance.
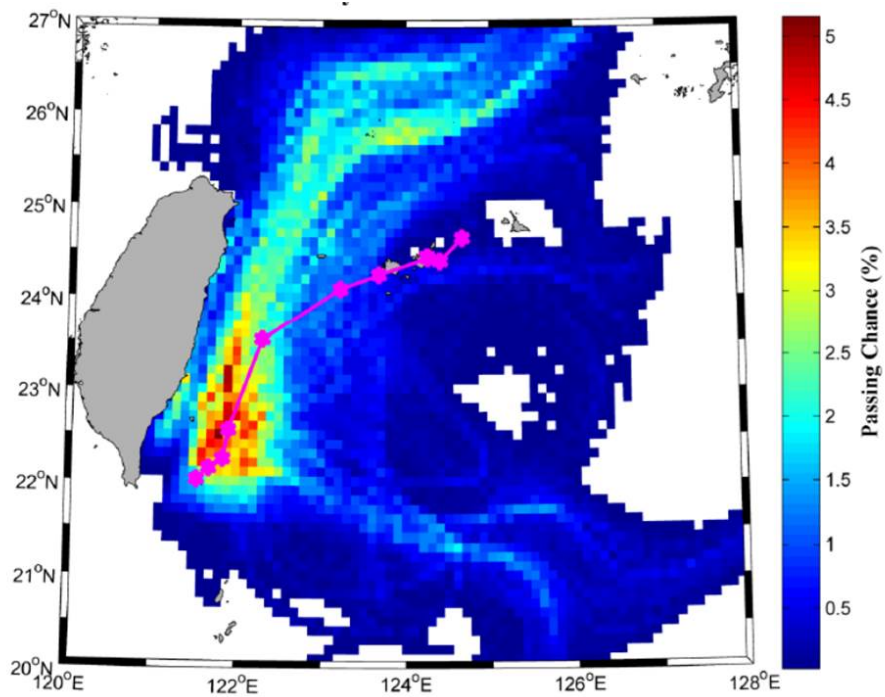
**Fig. 2.** The resulting probability of numerical Lagrangian drifter test. The color bar indicate the numbers of drifters passing a 0.1x0.1 degree box devided by the total number (4477).