Final Revisions

Referee #1 : David Webb

No minor revisions

Referee #2 : Anonymous

Minor revisions:
Review of "Interannual variability in contributions of the equatorial undercurrent (EUC) to Peruvian upwelling source water" by Gandy Maria Rosales Quintana et al.

I'm glad that the authors have conducted additional particle tracking experiments to address the previous lack of temporal sampling. The results from the additional experiments, however, do not appear to be utilized much in analysis.

An example: In Figure 5b (left and right) where particle age is displayed, the vertical axis is in calendar months. This is fine if only the release on 31 December of each year is considered. Now there are monthly releases, there is no longer a direct correspondence between age and a calendar month, what does this figure represent?

Response: This legend labelling was an oversight; we record age (prior to the start of backtracking in the coastal upwelling zone), irrespective of which month (Jan-Dec) that we start back-tracking. We have re-labelled the legend in days (0-365) prior to upwelling. Thank you for pointing this out.

Also, on lines 173-174: the text says "After around 2 months, particles are back-tracked to the Galapagos Islands …", the age contour of 180 days is near the islands, this is much longer than 2 months.

Response: We appreciate your scrutiny. We intended to refer to the time elapsed between average age near the Galapagos (180 days) and the approximate 120-day age at the edge of the upwelling zone. We have modified the text as, "Back-tracked particles are located near the Galapagos Islands around 2 months prior to arrival at the outer limit of coastal upwelling (noting mean age increases from 120 to 180 days) … (Line 176-177)"

And further, on line 180: 60-90 days (October-September)? The release on 31 December only?

Response: In these lines, we are referring to our 12-month (year-round) releases, and again reference to October-September is an oversight. We should more simply explain how, on a timescale of 60-90 days, back-tracked particles are traced to somewhat greater depth. We now clarify this text as follows: (Line 184)"Near the eastern boundary, particles upwelling across 100 m are traced to depths below 125 m, around 60-90 days prior to upwelling, but particles back-tracked into the EUC remain in the mean depth range 100-125 m from the Galapagos Islands to around 120°W."

Another problem with the analysis is grouping the results into calendar years. This does not represent well El Niño and La Niña events that usually cross calendar years. Figure 6 shows that there is considerable seasonality as well as interannual variability in the EUC transport, in addition to longitudinal variations. For example, particles released in 1997 (31 January to 31 December, 12 releases) are influenced by the current system during the time period of 31 January 1996 to 31 December 1997. Are these particles summed together to represent 1997 in Figure 7?

Response: Thank you for your comment. We intend here to compare experiments collectively, summing the data from monthly releases that span 2 years per experiment, to emphasize changes happening during warm and cold events that typically straddle calendar years – as pointed out by the reviewer. For instance, in the case of the experiment labelled '1997', particles sample currents over 1996 and 1997. We have accordingly modified the caption in Fig. 7, consistent with sampling flow across two years (per experiment). For further clarification, we have modified the text at line 94: "Note that for releases during a given year, particles sample currents over two years, across a calendar year boundary. For instance, if we back track particles throughout 1997, particles sample currents throughout 1996 and 1997. In analyzing Lagrangian data for releases through a given year (e.g., 1997), we aggregate the data across all 12 months of releases, and refer to the experiment accordingly (e.g., 1996/97)". In the caption of Fig. 7, we further clarify, "In (a) and (b), the number of particles per experiment are plotted at calendar year boundaries. In (c) and (d), particle percentages are labelled by the two calendar years across which currents are sampled."

Lastly, I would like to suggest a modification to Figure 9.

Fig. 9a: say "weak EUC in the eastern Pacific", for example, 1998/1999 La Niña.
Fig. 9b: say "strong EUC in the eastern Pacific", for example, 1997/1998 El Nño.

Note that the EUC in the central equatorial Pacific (e.g. 160°W) is strong in 1998/1999 and almost absent in 1997/1998 (Figure 6).

Response: Thank you for your suggestion. These clarification are now added.