*Review of*

**"Effect of the North Equatorial Counter Current on the generation and propagation 1 of Internal Solitary Waves off the Amazon shelf (SAR observations)"**

*by*

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This paper reports on some interested SAR observations of internal solitary waves on the Amazon Shelf. The observations show two distinct beams of waves emitted from two generation sites in close proximity to one another along the shelf break. Statistical properties of the internal wave packets (wave length, along crest length, number of waves per packet, direction of propagation) are analyzed. The more northern beam is affected by the North Equatorial Counter Current during the fall months. During this period a relatively strong eastward flow deflects the internal wave beam eastward and appears to enhance their propagation speeds. An intriguing aspect of the observations is that the solitary wave surface signatures first appear approximately 500 km off shore of their generation site. This is attributed to horizontally varying stratification: the pycnocline thins in the off-shore direction which increases nonlinearity as the internal tide propagates offshore. Both the horizontally varying stratification and the currents are based on climatological data hence, as the authors point out, it is possible that these effects are underestimated.

The paper reports on some new, interesting observations and the analysis and interpretations of them are well done. I only have some minor recommendations for improving the paper.

1. There are a number of places where the English could be improved. For example

    (a) abstract, lines 10–11: "... ever recorded. The main characteristics of the ISWs are ...".

    (b) page 3, line 8: "have benefited from'

    (c) page 3, line 16: ".. concerning global ..., in particular that owing to ..."

    (d) page 3, line 21: "...significantly far apart ..."

    (e) page 3, line 23: how does satellite altimetry confirm that IWs transport mass?

    (f) page 4, line 1: " ..  by other remote sensing methods to propagate considerable ..."

(g) page 4, line 7: "feature the Amazon shelf break as an important hospot for the ..."

(h) page 4, line 16: what is meant be 'admittedly' here? Do you mean 'presumably'. Later is should read "transfers to smaller-scale"

(i) page 4, lines 17–18: "'Brandt et al. (2002) confirmed the existence ..."

(j) page 4, line 22: "inter-packet distances ...".

(k) page 5, line 23: ".. implications for the redistribution"

(l) page 6, line 6: "... Section 2 describing ..."

(m) page 7, lines 3–4: ' ... preferences, since favorable stratification conditions for ISWs occur year-round in equatorial regions ..."

(n) page 11, line 15: "associated with the increase in their average ..."

(o) page 11, line 19: "... related to the ..."

(p) page 12, lines 13–16: "Note also that (delete comma) changes in ... because B generated waves only partially intersect the NECC (i.e. along ...."

(q) page 13, line 2: " $\phi$ represents the ..."

(r) page 13, lines 18: "underestimating its true influence....".

(s) page 13, line 21: I suggest deleteing the first clause to start with "We now turn to ..."

(t) page 14, line 16: " ... useful for guiding ..."

(u) page 16, line 2: "... a significant reduction in $C$ occurs between A and B ...."

(v) page 17, line 22: " vertical extent"

(w) page 18, line 11: "Two vertical profiles .."

(x) page 20, line 5: what is mean by $Ht$ performing?

(y)

2. I think it would be helpful to give more information on water depths where the waves are observed.

3. Page 13, equation (3). Sould be $\phi(-H) = 0$.

4. ISW widths are given in Figure 6. How exactly was the wave width defined?

5. Referring to HYCOM simulations 6.1 and 18.5 is not very informative. I don't see any value if even mentioning 'simulation 6.1'. Can you give more information regarding resolution, how long the simulation was for, does it include the NECC and the North Brazilian Current etc.?

6. Page 16, first paragraph. Is there a reason for the reduced generation between generation sites A and B? Reduced tidal currents?

7. page 19, line 8: Shouldn't use 'precisely' here. This is not very precise. Why was a 30 m amplitude internal tide used? What if it was 25 m or 20 m?

8. For several of the figures the labeling of the horizontal axis could be improved. For example in Figure 5 'km' appears directly under the fifth column. It would be better to have the number 300 there with 'km' below the numbers along the axis. Several other figures have this problem.

9. The caption for Figure 12 should say what the different coloured curves are for and what the solid vs dashed lines are for. It would seem better to change the vertical scales for panels (c) and (d) to zoom in, although really I don't see that these figures are necessary. The values for the two dispersion parameters are discussed in the text and I don't see that these figures add anything. It would be helpful to indicate $1°$ and $3°$ N along the axis and perhaps distances.

10. It would help if distances were included in Figure 11 instead of just latitude. The difference in stratication between profiles P1 and P2 doesn't seem to be very large. Perhaps show some $N$ profiles at some higher latitudes. What is the stratification like closer to shore or does figure go to the 500 depth contour?

11. Page 12, line 12. The current often looks to be more in the direction normal to that of wave propagation, not in the opposite direction.

12. Does the Amazon river outflow make any contribution to the observed phenomena? For example surface currents, setting the stratification? What is the cause of the offshore thinning of the stratified layer? Is it simple geostrophic balance with the Brazilian current or does the Amazon river plume have anything to do with it?