

## ***Interactive comment on “Campbell Plateau: A major control on the SW Pacific sector of the Southern Ocean circulation” by Aitana Forcén-Vázquez et al.***

### **Anonymous Referee #3**

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I was very interested in the synthesis of the series of hydrographic sections around New Zealand. A lot can be learned from revisiting old data in light of new understanding and new observations. However, the work presented doesn't go very deep into the data and is a fairly basic description of the hydrography. It's great to see all of the sections presented but there is no real synthesis in the end.

In the discussion, there is a comparison of the location of the fronts relative to previous studies. This seems the ideal lead into an examination of the interannual and seasonal variability in the front locations using altimetry. Or if Sokolov and Rintoul's (2009) paper did this in sufficient detail then their results could be brought more clearly into the

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discussion. Another comparison that could be easily made is to compare the vertical structure of watermass properties and geostrophic velocity along the hydrographic sections with sections constructed from the Argo (or other) climatology using the positions of the CTD stations. In this way the representativeness of the CTD sampling could be assessed, and some comment made about the seasonal and (perhaps) interannual change that is seen in the frontal structure.

I also agree with reviewer 1's excellent and detailed suggestions. Delving more into the density compensation using tools like Turner angles would be quite straight forward, and would add extra depth to the analysis.

I felt that this is on the way to being an excellent review of the circulation south of NZ, but it deserves to be framed better and I recommend the authors spend the time to at least examine the question of variability and representativeness of the sections.

Some detailed comments:

P4, line 16 – missing word, is it “density”?

Fig. 1 - It would be helpful to see the front positions from earlier studies on this map before you describe each of the sections.

P7, line 2 – “SR3 to the east of this region at 140E”, should be “west” and “near 140E”.

Figures 2-8 – The vertical sections are too compressed and it's difficult to make out the features in temperature and salinity. The black contours are also hard to read on the dark colours. Could you let panels a-d take up most of the page and place panels e and f on the RHS of a-d. Panel d doesn't need as much height as a-c.

P16, line 5 – insert “with” between “associated it”; change “front so is the transport” to “front, as is the transport”

P16, line 10 – “A strong jet >70 cm/s throughout the whole water column” – that's not evident in the figure. I think you mean “A strong jet throughout the whole water column,

with speeds up to 70 cm/s near the surface”

P16, line 11 – AAWS should be AASW.

P23, line 4 – change “where is found north” to “where it is found further north”.

P24, line 13 – Change “a correlation of local winds to the velocity” to “a correlation between local winds and the velocity”.

P25, line 23 – The sentence beginning “As previously noted . . . “ is incomplete and needs to be revised.

P27, line 5 – LCDP should be LCDW.

P29, line 11 – “Recent research” needs a reference.

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