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Interactive comment on “The dynamic connection of the Indonesian Throughflow, South Indian Ocean Countercurrent and the Leeuwin Current” by E. Lambert et al.

E. Lambert et al.

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Dear OS editor,

Thanks to the first reviewer for the response. We will give a quick first reply now and a more complete one once we have seen all other formal and/or informal reviews. Having seen the first review our short remarks are:

- The SICC is not a 'Parsons jet' ; it is the result of meridional frontogenesis in the open ocean with the frontal jet (the SICC) quite similar to subtropical counter currents (STCC's) in the other oceans. It is not the result of separation of a western boundary current that separates because it runs out of volume and thus outcrops. On the contrary

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it doesn't connect to the western boundary layer in the other STCC's.

- The ITF goes with the IO flow across the IO, via the Mozambique Channel into the Agulhas Retroflection. There most of it takes part in the retroflection and flows back (North)eastward with the Agulhas Return Current and encounters the outcrop front in the subtropical gyre. That is how the SICC and ITF are connected. The ITF has to return to the Pacific and does that via the Leeuwin current. Here the Island character of the circulation comes essentially into play.

- The eastern SICC is rectified by the eddy-eddy interactions, which shows also in the altimetry and in the high resolution model. That leads to the zonal continuation of the SICC (/ITF) also in the east and sets up the sea level against Australia and eventually creates a longshore poleward flow: the Leeuwin Current.

We will add a little paragraph to estimate the divergence of the eddy momentum fluxes and rectification in that region.

We are curious to learn more from the discussion to follow.

If we can already adapt more, please tell us.

Best regards,

Erwin Lambert

Interactive comment on Ocean Sci. Discuss., 12, 2231, 2015.

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