

## ***Interactive comment on “Reconciling the north–south density difference scaling for the Meridional Overturning Circulation strength with geostrophy” by A. A. Cimatoribus et al.***

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Equations (3) and (4) are given with “~” rather than a form with an explicit scaling factor, e.g.

$$\Psi \sim a \Delta b h^{*2}/(2f)$$

where  $a = 1$  corresponds to the transport expected if the “usual” thermal wind equation applies. [Here “ $b$ ” refers to gravitational acceleration  $\times$  density, otherwise notation is as in the OSD paper].

Moreover, figure 5 is plotted with axis scales normalised to the maximum of  $\Psi$  (“ $x$ ” axis)

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and the scaling formula (“ $y$ ” axis).

It would be interesting if the equations (3) and (4) and figure 5 axes could be given with fully explicit scaling so that effective scaling factors “ $a$ ” for (3) or (4) could be estimated. For example, it might be found that  $a \approx 1$  for the properly “aligned” equation (3) but that  $a$  is distinctly less than 1 for the “mis-aligned” equation (4) – depending on where  $\Delta b$  are taken.

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Interactive comment on Ocean Sci. Discuss., 10, 2461, 2013.