

Interactive comment on “On the Indonesian throughflow in the OCCAM 1/4 degree ocean model” by U. W. Humphries and D. J. Webb

Anonymous Referee #3

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Review of "The Indonesian throughflow in OCCAM" by Humphries and Webb

This paper consists of an analysis of the output of 2 eddy-permitting global ocean model runs focusing on mean and variability of the flow through the various passages connecting the Pacific and Indian Oceans. In general the model derived transports compare quite well with observations, but some discrepancies exist when looking to individual channels. Part of these discrepancies are discussed in terms of control points in relation to an unresolved channel topography, resulting in too wide channels in the numerical model and too weak effect of viscosity. An engineering fix in terms of partial gridbox widths is suggested to overcome some of these problems.

The paper is clear and well written and substantial enough to merit publication in OSD.

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I have 1 general comment.

The manuscript is quite descriptive and detailed, especially in the first part. Later, when the results are discussed in relation to Godfrey's Island Rule and discrepancies in mean transport between model and observations are discussed in terms of hydraulic control the paper gains depth. The authors could achieve a nicer balance between description and physical interpretation when also in the first half more interpretation is attempted.

The authors remark a strong bimonthly signal in the Molucca Strait and Halmahera Sea, which are attributed to "waves" (page 333). The authors could try to be more specific here. What kind of waves? Where are they generated, how do they travel and why do they have a 2-month period? It must be relatively easy to demonstrate these waves in the upstream area of the throughflow from the OCCAM-data. The authors remark that the wave signal is absent from the outflow at the Southern section. In other words timeseries of Molucca and Halmahera should be anti-correlated on the intra-annual timescale and the wave-induced signal has the character of a circulation around the Moluccas that is alternating cyclonic/anticyclonic. Could the authors confirm this? Also, what happens when higher-frequency wind signals are included? Is the wave-induced signal destroyed by wind effects or is it only masked by wind-induced higher frequencies? I am happy to accept the paper when the authors somewhat more elaborate on these points.

Interactive comment on Ocean Sci. Discuss., 4, 325, 2007.

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