

Interactive comment on “Tidal generation of large sub-mesoscale eddy dipoles” by W. Callendar et al.

Anonymous Referee #1

Received and published: 12 May 2011

A numerical model is used to examine dipole generation by tidal flows past Cape St James. This is a good use of a model to investigate and explain an observed phenomenon, focussing on a particular example but with wider interest. The results are analysed and interpreted carefully, and the conclusions are convincing (and not overstated). The paper is generally well-written and well-organised, and suitable for publication with relatively minor amendments.

p1 around line 17, include a bit more about the location of Haida here. Most readers will be familiar with Meddies (and “Mediterranean” is mentioned in the same sentence) but fewer will be familiar with Haida.

p2 top two paragraphs. An important generation mechanism of cyclonic eddies are overflows, and so perhaps this brief review should mention them too (e.g. Bruce 1995,

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Krauss 1996 for observations, Lane-Serff & Baines 1998 for lab experiments).

line 52 you don't define sigma here (presumably frequency), and you use a slightly different form of the Keulegan-Carpenter number later (page 17) with period T instead. I suggest decide on one version and define all the terms here.

I don't think you need the reference to page numbers, just sections (page 4 and various places thereafter)

page 4 around line 101: I assume these levels are terrain-following (sigma) coordinates, where they occupy a defined fraction of the local water depth? (Need to clarify) Also it would be good to give some idea of the typical biggest and smallest z-grid sizes in both deep and shallower water.

page 5 line 112 onwards. I'd like to see what the resulting tidal forcing looked like (e.g. tidal heights or speeds at the NW and SE boundaries against time)

line 123 when you say a quadratic drag coefficient of 0.008 for a depth of 50 m do you mean stress equals $0.008 \rho u_{50}^2$, where u_{50} is the velocity at 50m above the bed, or what?

page 7 figure 3 caption, need to explain inset box with curve (and dot)

page 10 line 199 page not pagea (spelling)

page 11 Figure 7 caption. Effect (not Affect). There appear to be some tracks on (b) but these aren't explained in the caption

page 13 line 229 “If we compare this to” insert “this”, I think?

page 15 Figure 13 caption refers to Figure 3.8

page 16 line 267 perhaps “yields and average radius of 3.5 km” would be better/

page 17 line 283 see earlier remark about Keulegan-Carpenter number

page 18 line 339 explain “spring freshet buoyancy changes”

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