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Discussions

Interactive comment on "A modelling study of eddy-splitting by an Island/Seamount" *by* Shengmu Yang et al.

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General comments

This manuscript presents the results of a series idealized ocean modelling simulations that illustrate the different behavior of eddy-splitting when an island/seamount is included in model's bathymetry. While the simulation results appear to be interesting, I have the following concerns with respect to the generalization and dynamic interpretation of the results:

1. The "Introduction" section provides a review of previous studies regarding eddy behavior under the influence of topography; however, the remaining questions and challenges on "eddies under the influence of island/seamount" are not explicitly explained. P3L10 states "The special processes and characteristics of splitting have not

been elucidated completely", and P3L15 says "to examine its kinematic characters and test eddy splitting process using numerical simulations". Indeed, the above statements are consistent with what being presented: the paper primarily focuses on describing kinematics of simulated eddies but offers little on understanding dynamics. One wonders whether this is sufficient for a primary publication. 2. A major conclusion of the study is the dependence of eddy behavior on two non-dimensional numbers: R the ratio of island radius to eddy radius, and S the ratio of eddy submergence depth to eddy vertical depth. The question to ask is: can eddy radius and vertical depth be all arbitrary? What role does background stratification – that defines the local Rossby radius of deformation – play in defining these length scales? I note that the background stratification is the same for all the model experiments. Can this limit the generalization of the dependence of splitting behavior on R and S? I feel that besides simply describing kinematics, providing dynamic explanation of the model results will make this study more valuable. 3. English writing needs significant improvement.

Technical corrections:

1. Model parameters: P5L13: 10^(-4) m^2/s for diffusion of heat: it is bit large for vertical but is way too small for horizontal. 2. Reference citation: a format seems to be odd, e.g., P2L23, "Chang et al. (Chang et al., 2012)", etc. 3. P12L17: reference of Sheng and Tang (2003): this study is for the Caribbean Sea but not for SCS. 4. P13L22 "Guihua, W" should be "Wang, G.", and similar for other co-authors listed.

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